



AGENDA  
CITY OF GLENWOOD SPRINGS  
REGULAR CITY COUNCIL MEETING  
FEBRUARY 6, 2025  
101 W. 8<sup>TH</sup> STREET  
6:15 p.m.

The agenda is subject to *change, including the addition of items 24 hours in advance or the deletion of items at any time.*

*The order and times of agenda items listed are approximate and intended as a guideline for the City Council.*

**ATTENTION:** To ensure your written comments are included in the City Council packet, public comments must be received by 4 p.m. on the day before City Council meetings. Comments may be submitted to [ryan.muse@cogs.us](mailto:ryan.muse@cogs.us). Written comments may be submitted after this deadline and will be shared via email to City Council but are not guaranteed to make it into the meeting packet. Submit comments at any time directly to City Council via email at [citycouncil@cogs.us](mailto:citycouncil@cogs.us).

**WORK SESSION**

|      |                                                |                        |
|------|------------------------------------------------|------------------------|
| 4:00 | 1. Resident Trash Removal Possibilities        | Information/Discussion |
| 4:15 | 2. Council Onboarding                          | Information/Discussion |
| 4:45 | 3. Micro Transit                               | Information/Discussion |
| 5:00 | 4. Break to get Dinner                         |                        |
| 5:15 | 5. Housing Priorities and Regulatory Standards | Information/Discussion |

**ZOOM INSTRUCTIONS**

Join from PC, Mac, iPad, or Android:  
<https://us02web.zoom.us/j/82663602427>

Join via audio:  
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**REGULAR SESSION**

|      |                                                                                                                       |                          |
|------|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| 6:15 | 6. Roll Call                                                                                                          |                          |
|      | 7. Agenda Changes & Conflicts                                                                                         |                          |
|      | 8. Council Announcements                                                                                              |                          |
|      | 9. Citizens Appearing Before Council (for items not on the Agenda-comments limited to 3 minutes) and Council Response |                          |
|      | 10. Consent Agenda                                                                                                    | Discussion and/or Action |
|      | A. January 16, 2025 Council Minutes                                                                                   |                          |
|      | B. Planning and Zoning Commission Reappointments                                                                      |                          |
|      | C. Award Request for Proposal 2024-26P Fire Station Bay Exhaust Removal System                                        |                          |
|      | D. Award Request for Proposal 2024-27P Wulfsohn Road Asphalt and Concrete Project                                     |                          |
|      | E. Award Request for Proposal 2024-29P Coach Miller Drive and 14th Street Design                                      |                          |
|      | F. Award Request for Proposal 2024-30P Citywide Street Striping                                                       |                          |



- G. Intergovernmental Agreement with Garfield County Regarding the April 1, 2024 Municipal Election
- H. Second Amendment to Memorandum of Understanding with Habitat for Humanity
- I. Ordinance 2025-02; Changing the Name of the Street Tax Fund. Second Reading

#### **ACTIONS AND/OR PRESENTATIONS**

- |                                                                            |                          |
|----------------------------------------------------------------------------|--------------------------|
| 11. Youth Tobacco Use                                                      | Information/Discussion   |
| 12. Ordinance 2025-05; Budget Amendment #2 (One Reading)                   | Discussion and/or Action |
| 13. Planning File 21-24; Roaring Fork Transportation Authority 1041 Review | Discussion and/or Action |
| 14. South Bridge Update                                                    | Information/Discussion   |
| 15. Fire Evacuation Presentation                                           | Information/Discussion   |
| 16. Ordinance 2025-04; Model Traffic Code Cell Phones                      | Discussion and/or Action |
| 17. Financial Advisory Board (FAB) Grant Direction                         | Discussion and/or Action |
| 18. Council Comments                                                       |                          |
| 19. Report from City Administration                                        |                          |
| A. City Manager                                                            |                          |
| B. City Attorney                                                           |                          |
| C. Correspondence Incoming/Outgoing                                        |                          |
| 20. City Council Social Event Location                                     |                          |
| 21. Adjournment                                                            |                          |

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**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Resident Trash Removal Possibilities

**Action Requested:** Staff will present a couple of ideas to provide residents an option to dispose of large items conveniently, similar to the Spring Clean-up project we've done in the past.

**Department:** Public Works

**Presented By:** Matthew Langhorst

**Strategic Goals:** Protect and Preserve our Quality of Life  
Ensure Public Safety

**Background Info:** Staff believes that Council has received a significant number of requests to reinstate spring clean-up. This is a discussion about what we think is possible and its timing.

**Issues:** NA

**Fiscal Impact:** Unknown at this time

**Legal Review:** NA

**Staff Recommendation:** NA



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                             |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Council Onboarding                                                                                                                                                                                                                          |
| <b>Action Requested:</b>     | None at this time.                                                                                                                                                                                                                          |
| <b>Department:</b>           | City Administration                                                                                                                                                                                                                         |
| <b>Presented By:</b>         | Steve Boyd, Karl Hanlon                                                                                                                                                                                                                     |
| <b>Strategic Goals:</b>      | Provide Efficient and Responsive City Government                                                                                                                                                                                            |
| <b>Background Info:</b>      | Staff has been in the process of developing and improving the onboarding and operational activities of City departments to promote efficiency and effectiveness. We have a drafted an initial version of a handbook for City Council.       |
| <b>Issues:</b>               | With three new City Councilors being sworn in after the April election we wanted to ask the incumbent Council for an assist in pulling together a document that will help them acclimate to Council roles and responsibilities more easily. |
| <b>Fiscal Impact:</b>        | NA                                                                                                                                                                                                                                          |
| <b>Legal Review:</b>         | Legal partnered with administration to develop the onboarding procedures.                                                                                                                                                                   |
| <b>Staff Recommendation:</b> | NA                                                                                                                                                                                                                                          |

## **Authority, Conduct, and Action at Meetings**

### **City Charter**

The City Charter establishes the City of government structure, powers, and responsibilities. The Charter and changes to it are voted on by the registered voters of the City. The adoption of a charter is provided for in the State Constitution and charter cities are often referred to as “home-rule municipalities.” The City of Glenwood Springs operates under a Council/Manager form of government. Under the Council/Manager form of government the City Manager is responsible for the day-to-day administration of the City's operations, while the City Council is the policy-making body.

View the [City of Glenwood Springs Charter](#) through our Municipal Code Library.

### **Municipal Code**

A municipal code is a collection of laws, ordinances, and regulations that govern a municipality. The municipal code addresses a variety of local issues from tax implementation, utilities and land use. All changes to the Code must be made by ordinance. The passage of an ordinance requires two readings at two different meetings. The first reading of an ordinance is also a public hearing where the public may comment on any proposed ordinance. The City of Glenwood Springs Municipal Code includes ordinances enacted by City Council.

View the [Glenwood Springs Municipal Code](#) through our Municipal Code Library.

### **Scope of Authority**

The scope of authority and role of City Council is limited by both the Charter and the Municipal Code. Section 3.1 of the Charter provides:

*All powers of the City not otherwise limited or conferred upon others by this Charter shall be vested in a Council consisting of seven members. It shall have the power to enact and provide for the enforcement of all ordinances necessary to protect life, health, and property; to declare, prevent and summarily abate and remove nuisances; to preserve and enforce good government, general welfare, order, and security of the City and the inhabitants thereof, to enforce ordinances and regulations by ordaining fines and sentencing as established in Section 13.12 of this Charter; to provide for the granting of probation and the conditional suspension of sentences by the Municipal Court; and to delegate to boards and commissions, within limitations of the Constitution and this Charter, such functions, powers, and authority of the City as it deems proper and advisable. No enumeration of particular powers granted to the Council shall be construed to*

*impair any general grant of power herein contained or granted by the Constitution, nor to limit any such grant to powers of the same class or classes as those so enumerated.*

The Charter goes on to provide for the selection of Mayor, terms of office, qualifications, meeting timing, and compensation. These are further refined in the Municipal Code Articles 020.010 and 020.030.

In Charter Section 3.10 the relationship of the Council and the administration is defined. It provides:

*Except for the purpose of inquiry, the Council and its members shall deal with the administrative functions of the City solely through the City Manager and neither the Council nor any member thereof shall give orders to any of the subordinates of the City Manager.*

In the absence of an action taken by City Council delegating such authority, no individual member has the authority to act on behalf of the City, including directing staff, the City Manager, City Attorney or Municipal Judge, or to bind the City in any way. There are occasions where City Council delegates authority to a member of Council to act on its behalf, such as a member appointed to the Board of Directors of RFTA to act on behalf of Council. All employee matters except those positions appointed by City Council (City Manager, City Attorney, and Municipal Judge) are assigned to and the responsibility of the City Manager.

### **Conflicts of Interest**

Conflicts of interest are often as much about perception as they are about actual defined conflicts. The perception of impropriety can and often is as damaging to the credibility of City Council decisions as an actual conflict. When in doubt about a conflict-of-interest issue, it is always better to discuss the matter either with the City Attorney or with another Council member. Oftentimes disclosure of a potential conflict on the record will insulate a proceeding from challenge later. This is especially true for quasi-judicial proceedings.

The Municipal Code provides extensive guidance on this issue. View the Municipal Code [Article 020.040 - Conflicts of Interest](#) for detailed information.

### **Types of Actions by Council.**

Council actions can be separated into three categories: 1) administrative, such as approving contracts, hiring appointed officials, and setting utility rates; 2) legislative, such as adopting municipal code revisions or comprehensive plan amendments; and, 3) quasi-judicial, such as approving a zoning change affecting a single piece of property, a variance, a special use permit or a liquor license. With some exceptions, when Council is acting in its administrative or legislative role information gathering and debate can be more informal. When Council is acting

in it's a quasi-judicial role, process and procedures to ensure substantive and procedural due process are critical.

### ***Legislative actions***

Legislative actions primarily involve the adoption of ordinances which amend the code or set policy for the City. All ordinances require two readings and are effective 10 days after publication on second reading except for emergency ordinances which are effective upon passage on second reading. Legislative acts are subject to referendum when the matter is referred to the voters by either the Council or via petition. Legislation can also be initiated by petition. All ordinances require a public hearing, and the Charter lays out that the public hearing occur on first reading. If there are no substantive changes most ordinances are approved on second reading on the consent agenda.

### ***Quasi-judicial actions***

Quasi-judicial actions have three characteristics. They involve a state or local law that: (1) requires notice be given before the action is taken; (2) requires a hearing be conducted before the action is taken; and (3) requires that the application of specific criteria be applied to the individual facts of the matter before them.

When acting in a quasi-judicial role, Council is charged with being an impartial decision-maker. In order to ensure impartiality all decisions must be made only on information in the record (typically presented at the hearing or contained in written materials such as the application and staff report).

The City has adopted the following procedure for quasi-judicial hearings that is used by Council and any other board or commission with quasi-judicial authority:

1. Presentation by staff followed by questions (not comments) from the reviewing body.
2. Presentation by the applicant followed by questions (not comments) from the reviewing body.
3. Public comment.
4. Response, if any, from the applicant to public comment.
5. Comments or additional questions for staff and occasionally the applicant.
6. Motion followed by discussion.
7. Vote.

Although the process is important to the proper exercise of a quasi-judicial role, it is equally important to maintain the appearance of impartiality. Colorado law contains a presumption that quasi-judicial hearings are conducted impartially. This presumption, however, can be overcome with evidence of actual bias, conflicts of interest, personal or private interest, prejudgment, or ex

parte contacts. The appearance of impartiality of the Council can be affected by the actions of individual councilors. To maintain the impartiality of quasi-judicial hearings, Council members must attempt to avoid encountering pre-hearing information and, if contact is unavoidable, evaluate whether recusal is needed. When in doubt regarding an issue Councilors should contact the City Attorney.

## **Open Records and Open Meetings**

As a public official, you should assume that all correspondence, including email and text, is subject to the Open Records Act requiring public disclosure of those documents. In other words, do not commit anything to writing that you do not want the public to read or the newspaper to publish. There are exceptions to this, including some types of work product and material that is attorney-client communication.

The Open Meetings Act requires public notice of all meetings attended by more than two (2) elected officials. This includes not only in-person meetings but email communications and discussions involving more than two (2) councilors as well as conference calls. As a result, keeping the City Clerk informed regarding event attendance is important to avoid statutory violations.

## **Prohibited Gifts**

In November 2006, the Colorado electorate adopted Amendment 41 adding a new Article XXIX to the Colorado State Constitution. That Article created gift limitations for state and local government officials and employees. One section of Amendment 41 exempted home rule municipalities from the application of the new Article XXIX if the municipality had other provisions in place (charter, ordinance, resolution) to address those matters. City Council adopted Ordinance No. 8, Series 2007 adding Article 010.060 that defines what constitutes a prohibited gift to city officials (defined to include a Councilmember, Board or Commission member, and employee).

The rule states that any gift is prohibited if it could improperly influence the official to depart from faithful and impartial discharge of the official's duties or if its primary purpose is to reward an official's action. The Municipal Code provides extensive guidance on this issue. View the Municipal Code [Article 010.060 - Prohibited Gifts to City Officials](#) for detailed information.

## **Conduct and Procedures for Meetings**

All regular meetings, special meetings, work sessions, and conference sessions of the City Council are noticed public meetings and open to the public. The City Council may conduct an executive session under limited exceptions.

## **Regular Meetings**

Regular Meetings are held in Council Chambers at City Hall on the first and third Thursdays of each month unless otherwise designated. Meetings convene at 6:15 p.m. and per the Municipal Code must adjourn no later than 11:00 p.m. unless a later time is agreed upon by a unanimous vote of all Council Members present at said meeting. In the event one or more agenda items have not been called before 11:00 p.m. and unanimous approval for extension of the meeting has not been obtained, such items shall be automatically continued to the next regular City Council meeting or a special meeting called per the Charter.

## **Special Meetings**

Special meetings of the Council shall be called by the City Clerk on the written request of the Mayor, or any two members of the Council, on at least twenty-four hours' written notice to each member of the Council. A special meeting may be held on shorter notice if all members of the Council are present or have waived notice thereof in writing.

## **Work Sessions**

Work sessions may be held at such time and place as a majority of the members may determine. At a work session, no formal vote shall be taken on any matter under discussion, nor shall any member enter a commitment with respect to a vote to be taken subsequently in a formal meeting. To encourage the interchange of ideas at work sessions, it shall be a standing policy that individual members are not quoted on ideas that they propose. Minutes of these proceedings are not required.

## **Conference Sessions**

The Mayor or the City Manager may call the Council together for a conference session at any time deemed necessary. Each conference session shall be devoted exclusively to matters regarding which the interchange of information preliminary to public action is deemed to be essential. Conference sessions may be held prior to regular or special meetings at such time and place as a majority of the members may determine. No formal vote shall be taken during a conference session on any matter under discussion, nor shall a Council member enter a commitment with another respecting a vote to be taken subsequently in a formal meeting. To encourage the interchange of ideas at conference sessions, it shall be a standing policy that individual members are not quoted on ideas that they propose. Minutes of these proceedings are not required.

## **Executive Sessions**

Executive sessions may be conducted only during a regular or special meeting of City Council; in accordance with Open Meetings Act, no final policy decision, resolution, rule, regulation,



formal action, or any action approving a contract, or calling for the payment of money shall be adopted or approved at any executive session. Executive sessions are only for consideration of the following:

- Consideration of employment matters related to the City Manager, City Attorney, or Municipal Judge.
- Legal matters that are attorney-client privileged.
- Discussions with the Chief of Police, District Attorney, or their appointed representatives on matters relating to security.
- To determine the City's position relative to issues that may be subject to negotiation, to receive reports on negotiation progress and status, to develop strategy, and to instruct the City's negotiators.

### **Agendas for Council Meetings**

The Municipal Code provides that the City Clerk and City Manager are responsible for setting and assembling the agenda and providing packets to the Council no later than noon on the Tuesday preceding the Thursday of each regular meeting of the City Council. In practice Council packets go out electronically the Friday preceding the next Council meeting. Matters to be considered at special meetings shall be only those as stated in the notice for the meeting.

*Agendas are organized as follows:*

#### **WORK SESSION**

| TIME | ITEM                           | ACTION |
|------|--------------------------------|--------|
| 1.   | <i>Subject of Work Session</i> |        |

#### **REGULAR SESSION**

2. Roll Call
3. Agenda Changes & Conflicts
4. Council Announcements
5. Citizens Appearing Before Council (for items not on the Agenda- comments limited to 3 minutes)
6. *Council Reaction to Citizen Comments*
7. *Consent Agenda*

*All matters under consent are considered to be routine and will be enacted by one motion and vote. The titles will not be read aloud. There will be no separate discussion on these items unless a Councilmember or Audience Member so requests.*

#### **ACTIONS AND/OR PRESENTATIONS**

8. [Any Action items or Presentations]

9. Council Comments
10. Report from City Administration
  - A. City Manager
  - B. City Attorney
  - C. Correspondence Incoming/Outgoing
11. Council Social Event Location
12. Adjournment

## **Presiding Officer**

The Mayor is the presiding officer at the City Council meetings. In their absence, the Mayor Pro Tem takes the chair of City Council. In the absence of the Mayor and Mayor Pro Tem, the City Clerk shall call the Council to order, and a temporary chairman is elected by the members of the Council present. Upon arrival of the Mayor at the meeting, the Mayor Pro Tem, if then presiding, shall relinquish the chair upon the conclusion of the business immediately before the Council. If a temporary chairman is presiding, they shall relinquish the chair upon the conclusion of the business immediately before the Council to the Mayor or Mayor Pro Tem upon the arrival of either.

## **Conduct of City Council Meetings**

### ***Public Comment for items not on the agenda.***

Council accepts public comment for items not on the agenda in writing or in person at a City Council meeting. Public comment is limited to 3 minutes. Comments should be directed to the Council not the audience. Council generally does not directly engage with public commentators but may provide reactions or comments under the “Reactions to Public Comment” agenda item.

### ***Public Comment on items on the agenda.***

Council generally accepts comments on any item on the agenda. Public comment is required for public hearings which primarily includes ordinances and land use matters. Public comment is limited to three minutes unless the Presiding Officer sets a greater limit. Comments must be directed to the Council and must address the item being considered. In person, in writing, and online comments are accepted for specific agenda items.

Meetings generally utilize a simplified Robert’s Rules of Order to govern debate, motion and decisions on matters except for quasi-judicial public hearings which utilize the procedures outlined above.

### ***Voting by the Council.***

- The City Clerk shall call the vote.

- All voting upon ordinances, resolutions, and motions shall be in conformity with the Charter.
- Except as otherwise provided in the Charter or in this Code, a motion shall be deemed carried if a quorum is present and a majority of those voting vote "yea."
- No affirmative action may be taken upon a tie vote; and, in the event the matter being voted upon action of Council, including but not limited to, liquor licenses and items pursuant to Title 070, a tie vote shall be considered to be a denial of the matter.
- In the event a Council member abstains the Charter provides that their vote is recorded as a "yea."
- Council Members not entitled to vote on a motion because of personal or private interest shall be deemed present for purposes of determining whether there is a quorum present.

### ***Types of motions***

- Main Motion: Introduce a new item.
- Subsidiary Motion: Change or affect how to handle a main motion (vote on this before the main motion).
- Privileged Motion: Urgent or important matter unrelated to pending business.
- Incidental Motion: Questions procedure of other motions (must consider before the other motion).
- Motion to Table: Kills a motion.
- Motion to Postpone: Delays a vote (can reopen debate on the main motion).

***Robert's Rules of Order Cheat Sheet***

| <b>Action</b>                                         | <b>What to Say</b>                                           | <b>Interrupt Speaker?</b> | <b>Need a Second?</b> | <b>Can be Debated?</b> | <b>Can be Amended?</b> | <b>Votes Needed?</b> |
|-------------------------------------------------------|--------------------------------------------------------------|---------------------------|-----------------------|------------------------|------------------------|----------------------|
| <b>Introduce main motion</b>                          | "I move to..."                                               | <b>No</b>                 | Yes                   | Yes                    | Yes                    | Majority             |
| <b>Amend a motion</b>                                 | "I move to amend the motion by..." (Add and/or strike words) | <b>No</b>                 | Yes                   | Yes                    | Yes                    | Majority             |
| <b>Move item to committee</b>                         | "I move that we refer the matter to committee."              | <b>No</b>                 | Yes                   | Yes                    | <b>No</b>              | Majority             |
| <b>Postpone item</b>                                  | "I move to postpone the matter until..."                     | <b>No</b>                 | Yes                   | Yes                    | <b>No</b>              | Majority             |
| <b>End debate</b>                                     | "I move the previous question."                              | <b>No</b>                 | Yes                   | Yes                    | <b>No</b>              | Majority             |
| <b>Object to procedure</b>                            | "Point of order."                                            | Yes                       | <b>No</b>             | <b>No</b>              | <b>No</b>              | Chair decision       |
| <b>Recess the meeting</b>                             | "I move that we recess until..."                             | <b>No</b>                 | Yes                   | <b>No</b>              | <b>No</b>              | Majority             |
| <b>Adjourn the meeting</b>                            | "I move to adjourn the meeting."                             | <b>No</b>                 | Yes                   | <b>No</b>              | <b>No</b>              | Majority             |
| <b>Request information</b>                            | "Point of information."                                      | Yes                       | <b>No</b>             | <b>No</b>              | <b>No</b>              | No vote              |
| <b>Overrule the chair's ruling</b>                    | "I move to overrule the chair's ruling."                     | Yes                       | Yes                   | Yes                    | <b>No</b>              | Majority             |
| <b>Extend the allotted time</b>                       | "I move to extend the time by _____ minutes."                | <b>No</b>                 | Yes                   | <b>No</b>              | Yes                    | 2/3 Vote             |
| <b>Enforce rules or point out incorrect procedure</b> | "Point of order."                                            | Yes                       | <b>No</b>             | <b>No</b>              | <b>No</b>              | No vote              |
| <b>Table a motion</b>                                 | "I move to table..."                                         | <b>No</b>                 | Yes                   | <b>No</b>              | <b>No</b>              | Majority             |

## **Council Norms and Expectations.**

### **Attendance.**

Section 3.5 of the Charter states that a Councilmember's office becomes vacant when they are recalled, become incapacitated, resigns or misses three consecutive meetings or moves out of the City. *Charter Sec. 3.5*. Council members typically advise the Mayor, City Manager and the City Clerk if they are going to be absent from a meeting. Keeping everyone informed is critical to ensure that there is a quorum for meetings. The Council did adopt a remote participation policy during COVID which remains in place to allow Council members to participate under limited circumstances if they will be absent or are sick. Except in instances where a quorum cannot be met any other way Council members should not feel obligated to attend when they are vacationing, away for work, or under the weather. While not required by the Charter or Municipal Code Council members are expected to attend work sessions. Often work sessions are critical for Council members to receive information, ask questions and dive more deeply into issues before formal consideration at a future Council meeting. Examples of this are looking at rate studies, drafts of planning documents and reviewing projects.

### **Communication with Staff.**

1. Questions to City staff should be directed through the appropriate senior City staff. Questions should be directed to the City Manager or senior staff.
2. The City Manager should be copied on any request or communication to Department Heads. Council members should not set up meetings with department staff directly but work through Department Heads who will attend any meetings with council members. When in doubt about what staff contact is appropriate, council members should ask the City Manager.
3. All Council members should have the same information with which to make decisions.
4. Council members, including the Mayor, should not get involved in administrative functions. Avoid any staff contacts that may be construed as trying to shape staff recommendations. Council members shall refrain from coercing staff in making recommendations to the Council as a whole.
5. Do not attend staff meetings unless requested by senior staff. Even if the Council member does not say anything, the Council member's presence may imply support, show partiality, intimidate staff or hamper staff's ability to do their job objectively. Additionally, in such circumstances, individual council members are receiving information prior to the rest of the Council.

6. If a council member wishes to attend a meeting related to City business, as a representative of the City (negotiating session, staff committee meeting etc.), the council member shall obtain approval of the Council prior to the meeting with the understanding that the council member will report back to the Council regarding the meeting. The report shall be given at a regular meeting of the Council held in open session. Council members attending meetings of boards, committees or commissions on which they serve do not need to obtain prior approval of the Council.
7. Depend upon the staff to respond to citizen concerns and complaints. It is the role of council members to pass on concerns and complaints on behalf of their constituents. It is not appropriate to pressure staff to solve a problem in a particular way. Refer citizen complaints to the appropriate senior staff or City Manager. Staff is responsible for making sure the council member knows how the complaint was resolved.

### **Communication with the press and public.**

It is primarily the responsibility of the Mayor to communicate with the press on specific issues before Council, decisions by Council and other requests the press may have of the Council. The Council has adopted a communication policy which is available here [\[insert link\]](#).

Communication with constituents is the responsibility of individual Council members consistent with the communication policy.

### **Decorum during meetings.**

It is the goal of Council to fairly and openly debate and decide issues before it. In order to do that the presiding officer is responsible for recognizing members who wish to speak, both calling attention to and if necessary, cutting off members who are engaged in personal attacks of the public, staff or other Council members and to maintain an orderly meeting. The presiding officer may additionally call a recess, or in extreme circumstances adjourn a meeting if in the presiding officers' judgment, it is necessary to maintain a safe and courteous environment for the public, staff, or the Council.

### **Security.**

Staff will brief Council separately on security issues.



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Micro Transit

**Action Requested:** None.

**Department:** Engineering

**Presented By:** Ryan Gordon, Lee Barger

**Strategic Goals:** Preserve and Improve Infrastructure

**Background Info:** The City will be beginning an 8-month pilot program for city-wide On-demand transit service provided by the Downtowner starting in April 2025. This service will be called Ride Roaring Fork - Glenwood Springs and will be accessible under a valley-wide common mobile application known as Ride Roaring Fork. As a pilot program, it will be introduced as a fare-free service for six months, at which point we will have the data to develop a fee structure that would be favorable towards customers connecting to or from the Ride Glenwood local and RFTA regional routes, and other identified routes that make sense to incentivize. Staff understands the challenges of finding a sustainable funding source for this service, so we are using this pilot to provide staff with ample origin/destination/ridership data to be provided by the Downtowner service.

The service will start with 4-5 vehicles including Wheelchair Accessible Vehicles. Times/days of service will be similar to the Downtowner service in Carbondale. Staff is in discussions with the Downtowner and will provide finer details at a later work session as we get closer to launch. The Downtowner is currently operating in Aspen, Basalt and Carbondale, and is made possible from a three-year start-up grant from Roaring Fork Transportation Authority (RFTA).

**Issues:** N/A

**Fiscal Impact:** N/A

**Legal Review:** N/A

**Staff Recommendation:** N/A

# **DOWNTOWNER PILOT PROGRAM**

## **Town of Carbondale**

**February 6, 2025**

**Jared Barnes, AICP**  
Planning Director

**Lauren Gister**  
Town Manager

511 Colorado Avenue, Carbondale, CO 81623  
(970) 963-2733 Fax: (970) 963-9140





# PILOT PROGRAM CONTRACT

- **6-month pilot program: July – December 2024**
- **FLMM Funding Partnership – RFTA/Town**
  - **\$18K set up costs (100% Town)**
  - **\$60K/month operating (50/50 split)**
  - **Pilot Total - \$378K; Town - \$198K + incidentals**
- **Service Hours: M-F, 7AM-10PM; Sa-Su, 9AM-10PM**
- **2 vehicles in service, 1 spare vehicle**
- **Average wait time: 20 minutes**
- **Average trip time: 15 minutes**

# PILOT PROGRAM STATS

- **Steady monthly growth**
  - **July**
    - 1,128 rides
    - 278 unique acnts
    - 5 min avg wait time
    - 7% shared rides
    - 2.3 psngrs/rev hr
  - **December**
    - 5,406 rides
    - 734 unique acnts
    - 11 min avg wait time
    - 43% shared rides
    - 9.4 psngrs/rev hr
- **479% growth in rides**
- **264% growth in accounts**

# GROWING PAINS

- **Ridership growth has created some operational pinch points:**
  - **Long waits (30-50min) during peak travel times (3-7pm)**
  - **Tough to plan trips (wait time could be 5-45 min)**
- **School service**
  - **Town prohibited trips from schools, but lots of travel from students throughout the day from the closest point (Carbondale Fire District Admin Building)**
- **Information about service**
  - **Map of service area is confusing**
  - **Town website/app doesn't include policies**



# LESSONS LEARNED

- **Initial set up**
  - **Required significant local staff resources**
    - **Bilingual translation**
    - **Outreach/Awareness**
  - **Appropriate vehicle size**
- **Determine service priorities and goals before starting service**
  - **Helps to develop check point on requested changes**
- **Determine fare-free or fare-collected**
  - **Could be hard to charge for something that was free**
- **Long-term funding considerations after 3-year FLMM grant**

# LESSONS LEARNED

- **School Service – getting stuck in school traffic which delays other trips**
- **Monthly Reporting – important data (e.g. Age, Drop-off/Pick-up locations, cost/rider).**
- **Policy Decisions**
  - **Pets**
  - **ADA and mobility-limited accessibility**
  - **Child seats**
  - **Sporting Equipment**



## **Carbondale Ridership Report**

### **December 2024**

#### **General Stats**

**Rides:** 5,406  
**Passengers (unlinked passenger trips):** 7,625  
**Vehicle revenue hours:** 814  
**Total vehicle hours:** 872  
**Vehicle revenue miles:** 9,131  
**Total vehicle miles:** 9,260  
**Passenger miles:** 8,491  
**Unique rider accounts:** 734  
**Passengers per revenue hour:** 9.4  
**Percent of rides shared:** 43%  
**Average wait time:** 11 minutes  
**Average ride distance:** 1.2 miles  
**Average experience rating:** 4.9 out of 5  
**Wheelchair rides:** 48  
**No shows:** 138

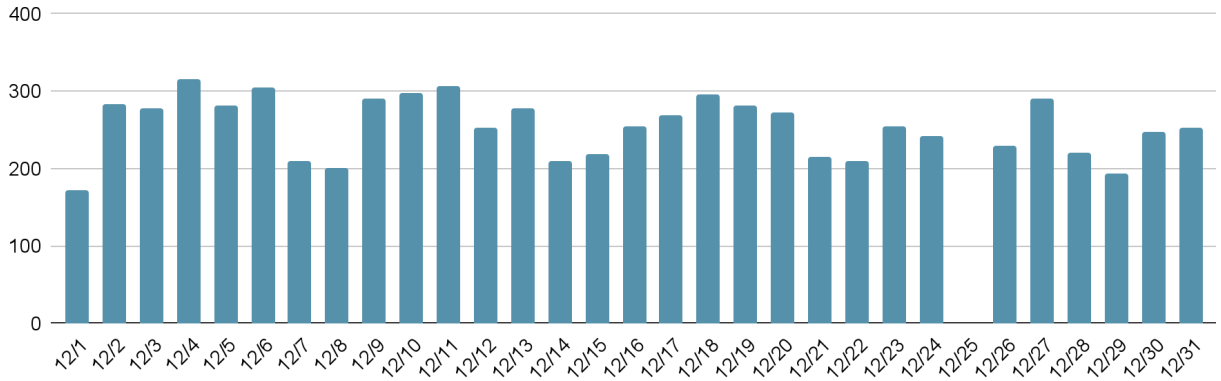
#### **Wait Time Distribution**

**0 - 10 min:** 56%  
**10 - 20 min:** 31%  
**20 - 30 min:** 10%  
**30+ min:** 3%

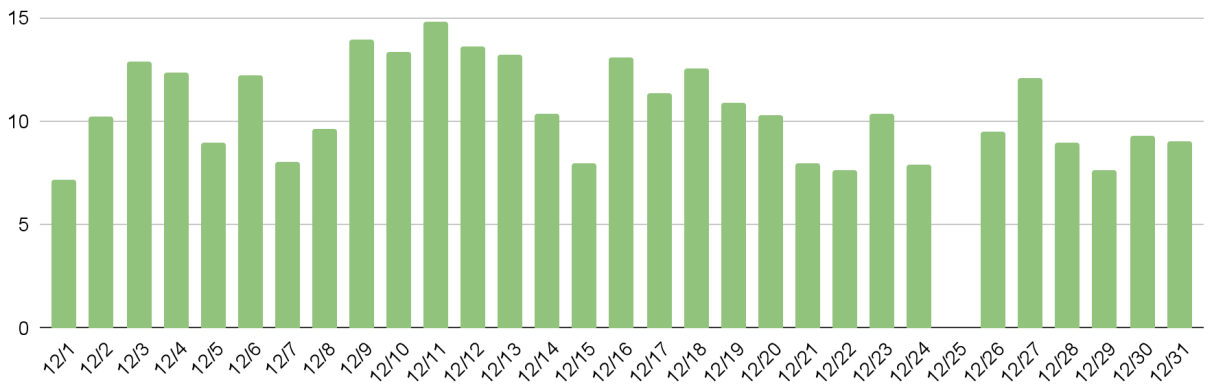
#### **Passenger Selection**

|               |               |
|---------------|---------------|
| <b>1:</b> 76% | <b>6:</b> 1%  |
| <b>2:</b> 16% | <b>7:</b> 0%  |
| <b>3:</b> 5%  | <b>8:</b> 0%  |
| <b>4:</b> 2%  | <b>9:</b> 0%  |
| <b>5:</b> 1%  | <b>10:</b> 0% |

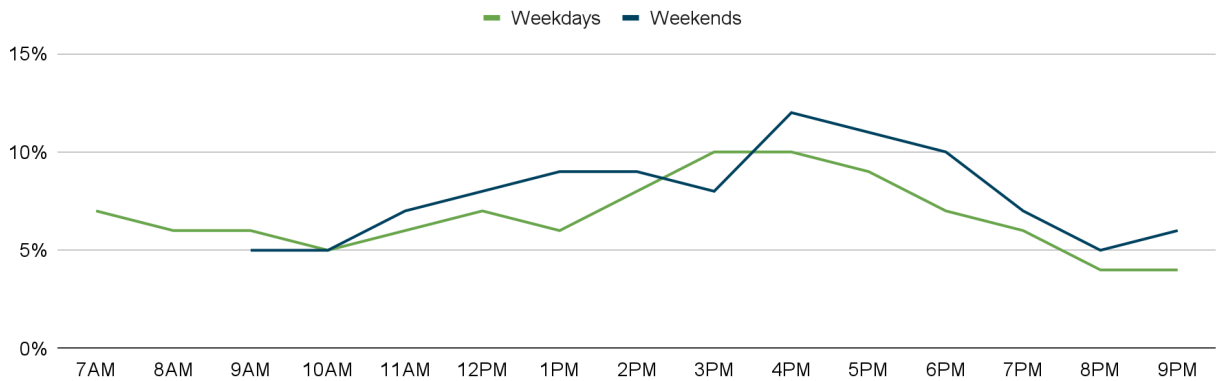
## Passengers



## Average Wait time

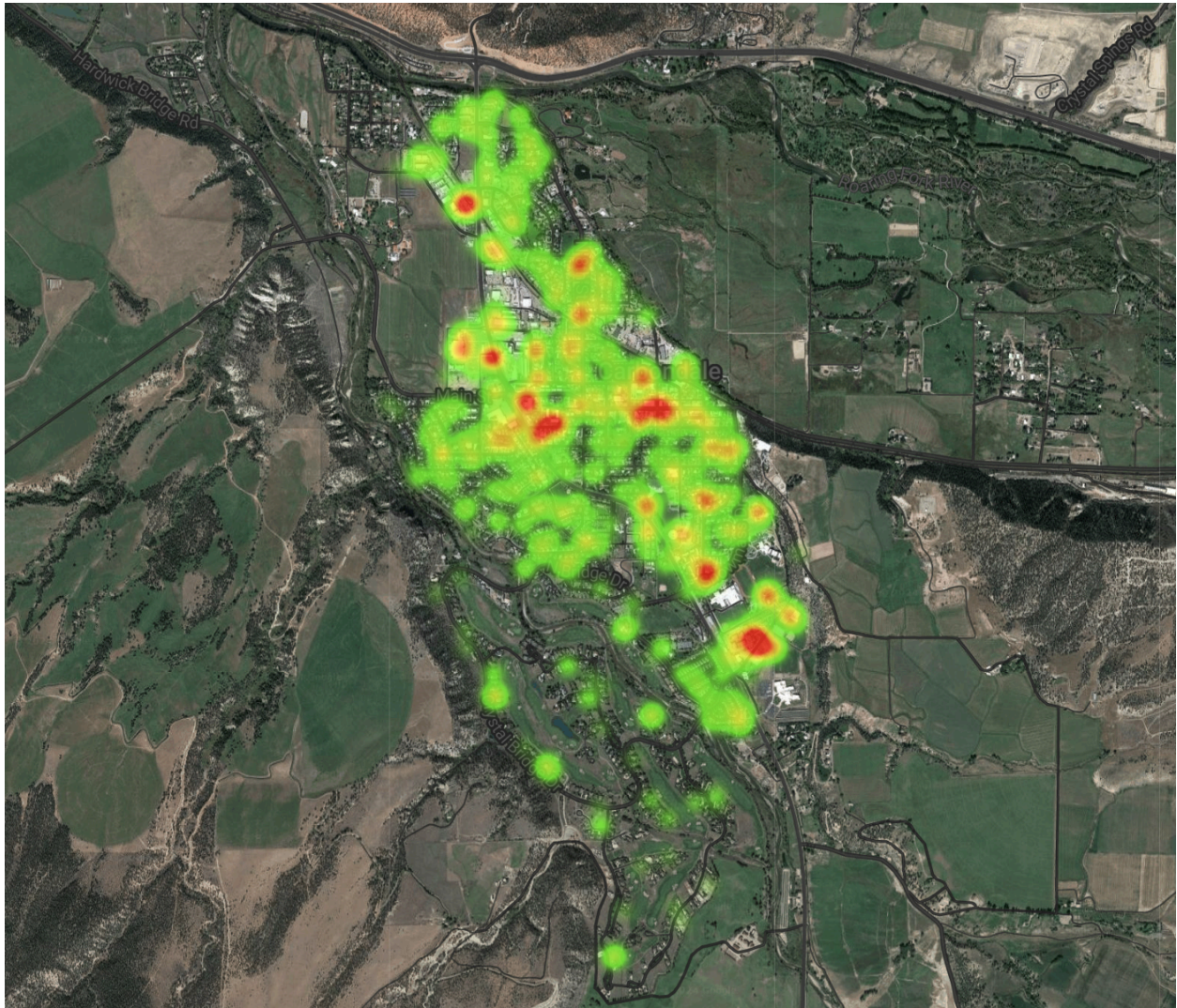


## Demand by Hour



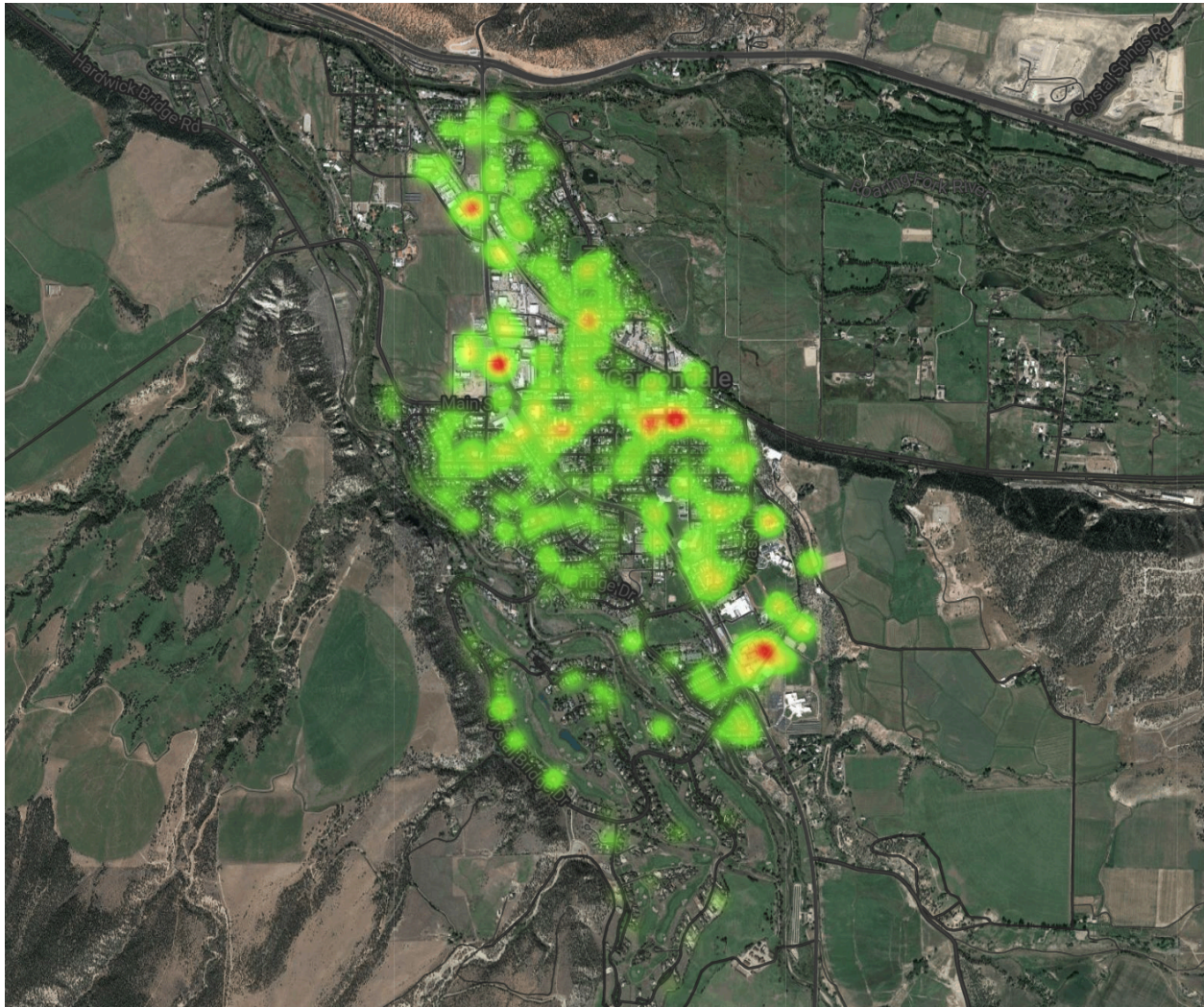


## Pickups Heat Map





## Dropoffs Heat Map



## Passenger Distribution

| number_of_rides | rider_accounts | total_rides |
|-----------------|----------------|-------------|
| 1               | 208            | 208         |
| 2               | 116            | 232         |
| 3               | 66             | 198         |
| 4               | 50             | 200         |
| 5 or more       | 293            | 4423        |

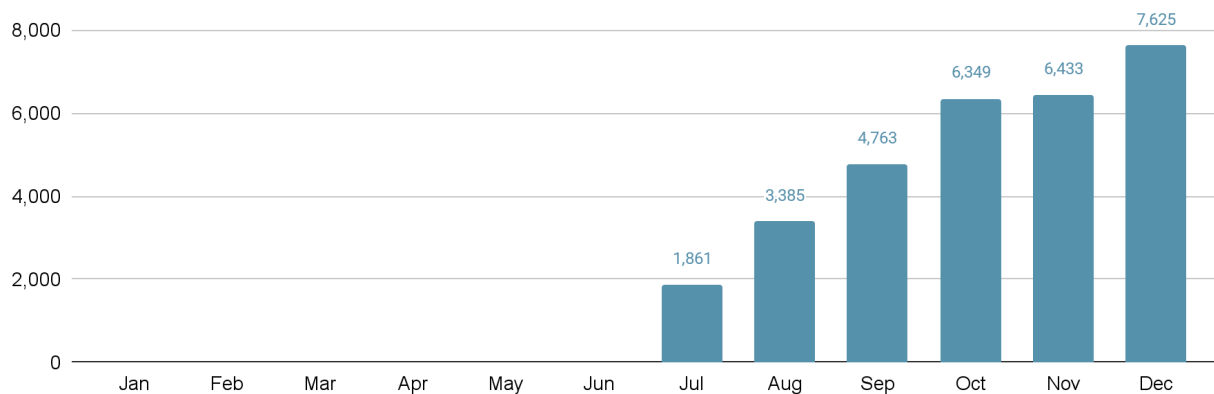
**Senior Living** Sopris Lodge / Columbine House / Heritage Park Care Center  
Passengers: 113

**Carbondale Park and Ride**  
Passengers: 2,536 (33% of all passengers)

## Top 3 Pickup Locations

- 1) Carbondale Park & Ride
- 2) City Market
- 3) 900 Garfield Ave Apartments

## All-Time Ridership





**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Housing Priorities and Regulatory Standards

**Action Requested:** Discussion of regulatory standards

**Department:** Economic and Community Development

**Presented By:** Hannah Klausman

**Strategic Goals:** Provide Efficient and Responsive City Government

**Background Info:** Regulatory Standards, Development Code and Engineering Standards, Process  
Staff has received feedback from Council and the public that the regulatory standards and processes for approval surrounding smaller projects warrants review.

Staff has attached several process guidelines to illustrate common administrative and public hearing processes from the Planning Department.

Title 070 of the Municipal Code details the requirements and allowances for all development in Glenwood Springs, from Single Family Homes to multi-storied apartment complexes and commercial facilities. The main categories of Development Standards include:

**ARTICLE 070.040 - DEVELOPMENT STANDARDS**

**070.040.020 - Sensitive Area Protection.**

Intended to protect and enhance the natural features and ensure that land subject to natural hazards such as flooding, falling rock, landslides, mud flows, or snowslides is not approved for development without safeguards to help protect life, health, and property.

**070.040.030 - Site Development and Improvement Standards.**

This Section is intended to ensure that a developer shall install appropriate infrastructure, preserve vegetation; stabilize soil, reserve and dedicate any easements for drainage purposes, pedestrian easements, and parkland; and ensure the completion of installation of curbs, gutters, street paving, and other improvements and to ensure that dedications are made.

**070.040.040 - Common Open Space.**

Common open spaces are set aside for the use and enjoyment of a development's residents, employees, or users. The percentage of required open space is determined by zone district.

**070.040.050 - Landscaping, Screening, and Fencing.** The purpose of this Section is to ensure that landscaping, screening, and fencing is provided to protect and enhance the visual appeal of Glenwood Springs; improve air quality; buffer neighboring land uses; mitigate the environmental and visual impacts of surface parking areas; protect residential and commercial property values; and extend water supply and water infrastructure by enhancing efficiency and eliminating outdoor water waste.

**070.040.060 - Off-Street Parking and Loading.** The purpose of this Section is to ensure that safe and convenient parking areas are provided to respond to transportation and access demands of various land uses throughout the City, mitigate traffic congestion, avoid and mitigate the adverse visual impact of large concentrations of exposed parking, reduce stormwater runoff and heat island effect from large expanses of pavement, and improve water quality, provide necessary access for service and emergency vehicles; and provide for safe and convenient interaction between vehicles and pedestrians.

**070.040.070 - Access and Circulation.**The purpose of this Section is to support the creation of a highly connected transportation system within the City in order to provide choices for drivers, bicyclists, and pedestrians; increase effectiveness of local service delivery and reduce emergency service times; create connectivity, reduce vehicle miles of travel; improve air quality; mitigate the traffic impacts of new development; and avoid the creation of large, isolated tracts without routes for through traffic or pedestrian and bicycle connections.

**070.040.080 - Residential Site and Building Design.**This Section is intended to promote high quality development and construction, protect the character of established neighborhoods, encourage a variety of housing choices and affordability levels, provide visual interest in exterior design, enhance streetscapes, and protect property values.

**070.040.090 - Nonresidential and Mixed-Use Site and Building Design.**This Section is intended to promote high-quality building design and is intended to promote visual interest, ensure compatibility between residential and adjacent commercial uses, mitigate large bulk of large buildings, promote multi-modal access, enhance property values and encourage further investment.

**070.040.100 - Exterior Lighting.***Purpose.* The purpose of this Section is to provide for exterior lighting that enhances safety, preserves the City's nighttime character, and improves the ability to view the nighttime sky from within the City. This Section is intended to decrease light pollution, increase energy efficiency, and promote high quality lighting design as it relates to the built environment.

**070.040.110 - Signs.**The purpose of this Section is to minimize incompatibility between signs and their surroundings, provide for signs within reasonable limitations, consistent with the goals and objectives of the community, to retain the special character and economic advantages that rest largely on the quality of the community's appearance; eliminate hazards caused by the size and placement of signs, and protect the right to free speech.

#### **ARTICLE 070.045 - COMMUNITY HOUSING STANDARDS AND GUIDELINES—ADMINISTRATION**

The purpose and intent of the regulations set forth in this article is to increase affordable housing choices for year-round residents and to preserve a balance between second homeowners and locals.

#### **Engineering Standards**

Additionally, projects are required to adhere to the Engineering Standards available at [www.cogs.us/Engineering-standards](http://www.cogs.us/Engineering-standards), which include requirements for submittal of detailed technical reports such as drainage plans, grading plans, geohazard reports, traffic reports, and stamped engineered drawings of some site components such as retaining walls and water detention facilities. These aspects of a project proposal are not known until the technical reports are completed often leading to discovering issues with the property such as being in a geohazard area requiring mitigation, steep slope grades that aren't feasible for site elements, and inadequate square footage to fit desired project components.

Staff has also included the Construction Management Plan checklist that is utilized during the building permit process as an attachment to this report.

#### **Issues:**

**Fiscal Impact:** Regulations have impacts on the cost of construction. Those costs vary.

**Legal Review:** N/A

**Staff Recommendation:** Staff defers to Council to discuss areas that are deemed appropriate to review for changes to regulation or process standards.





## **Minor Subdivision Application Guide & Checklist**

Economic & Community Development Department  
101 W. 8<sup>th</sup> Street  
Glenwood Springs, CO 81601  
(970) 384-6411

### **PURPOSE**

The Minor Subdivision review is an administrative process used to evaluate proposed subdivisions that will create few lots or involve minimal adjustments to approved final plats. The Minor Subdivision procedure also provides an administrative process to correct plat errors and to adjust property boundaries.

### **GENERAL OVERVIEW**

The Minor Subdivision review applies to:

- Properties within an approved preliminary plat;
- Subdivisions creating 3 or fewer lots or 10 or fewer condominium units within a single plat; and
- Condominiumizations within an existing building that do not include land dedication.

The following types of projects can be processed as minor subdivisions:

1. Consolidation of two or more lots into a single lot on a single, previously recorded final plat;
2. Boundary or lot line adjustment to an approved final plat; or
3. Correction of errors on an approved final plat.

**Land dedication.** Any subdivision or adjustment that involves dedication to the City of right-of-way, other public tracts, or public improvements shall be reviewed by City Council for acceptance or denial of the dedication.

**Condominiumizing an existing building.** If you are condominiumizing an existing building, the Community Development Director may require that you bring the property into compliance with the Municipal Code and ordinances as necessary to safeguard public health, safety and welfare.

### **REVIEW PROCESS**

All Minor Subdivision applications are reviewed and decided upon by the Community Development Director and shall follow the procedures outlined below. The Director will consider whether the minor subdivision -

- a. Is consistent with the Comprehensive Plan;
- b. Is consistent with the intent of the underlying zoning district;

- c. Complies with applicable dimensional, development, and design standards in the Code;
- d. Does not affect a recorded easement without approval from the easement holder;
- e. Will not result in adverse impacts to surrounding property; and
- f. Will not limit the City's ability to effectively provide facilities or services.

1. **Pre-application Conference.** Contact one of the planners in the Community Development Department prior to submitting your Minor Subdivision application. We will discuss the administrative review procedures, application requirements, decision timelines, and the City's goals, policies, and development standards as they relate to your proposed project.

At least 10 days prior to your scheduled conference, please submit one electronic copy of the following items:

- a. A completed Planning Application. The application is available [here](#), or on the City's website at [www.cogs.us](http://www.cogs.us). It is in "Forms, Permits & Applications" on the Community Development Department page.
- b. A written description of the proposed project.
- c. Conceptual drawings showing the location, layout, and primary elements of the proposal.
- d. Proposed uses, location of uses, and densities.

If your project involves more than one administratively reviewed development action for the same property, your applications can be processed concurrently. Community Development Department planners will discuss the concurrent review process and application requirements with you during your pre-application conference

2. **Prepare Your Application.** During the pre-application conference you will receive a checklist of information that we will need to process your request. This information constitutes your application and may include any, or all the information found on page 5 of this guide.

City staff will evaluate your application based on how well it demonstrates compliance with the Municipal Code, and the City's goals, policies, and plans. You may review the Municipal Code on the City's website at [www.cogs.us](http://www.cogs.us). Other approved plans also can be found on the City's website under the individual department pages. Community Development staff will help guide you to plans and policies that may be applicable to your project.

3. **Submit Your Application.** Submit an electronic copy of your completed application to the Community Development Department on or before the 8-week application deadline. Within 5 business days of your submission, Community Development Department staff will review your application to determine whether it is complete. If it is incomplete, we will



contact you with a list of the information needed to complete your application. You are encouraged to submit your application well in advance of the application deadline to allow you time to supply any missing information. Submissions after the deadline will delay your review and decision.

- 4. Provide Additional Copies.** After Community Development Department staff deems it complete, you will be asked to supply a final, complete electronic set of your application materials as well as paper copies for distribution to the City's reviewing departments and outside agencies. The number of paper copies can vary depending upon the scope of your application. The paper format of your submission may vary. If your application includes any full-sized plan sheets, we may request submission on 11" x 17" or 24" x 36" size paper.
- 5. Development Review Committee Referral and Review.** Prior to rendering a decision on your project, your application may be referred to the Development Review Committee which consists of various City departments, City boards and commissions, and outside agencies such as the Colorado Department of Transportation, and gas and telephone companies. Community Development Department staff relies on these agencies to review your application and comment on any issues or concerns that they may have relating to your project. In some instances, review committee comments may cause you to redesign your project.
- 6. City Department/Applicant Development Review Committee Meeting.** If your application is referred to the Development Review Committee, you will meet with the committee to review and discuss their comments about your project. In some cases, the committee may request revisions or additional information. You will need to submit your revised materials or additional materials prior to receiving a decision on your project. Staff will distribute your additional information to the committee and will generally allow 2 weeks for their further review and comment.
- 7. Staff Review & Report.** Community Development Department staff will prepare a summary report for the Community Development Director that analyzes how your project meets the Municipal Code, the City's goals, policies, plans, standards and any other pertinent information. The report will include a staff recommendation of approval or denial. If staff recommends approval, usually there also will be a list of recommended conditions. You will receive a copy of this report, usually via email. Make sure that you read the report and review the listed conditions, if there are any.
- 8. Post-approval.** After you have satisfied all applicable conditions of your project's approval, Community Development Department staff will ask that you provide two copies of your final plat on 24 x 36-inch Mylar paper for recording with the Garfield County Clerk & Recorder.

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## MINOR SUBDIVISION APPLICATION CHECKLIST

*For office use:*

Pre-application Meeting Date: \_\_\_\_\_ Planning File #: \_\_\_\_\_

Applicant: \_\_\_\_\_ Carpenter \_\_\_\_\_ Lead Planner: \_\_\_\_\_

During or shortly following your pre-application meeting, you will receive this checklist noting all of the materials that the City will need to process your Minor Subdivision application. This information constitutes your application. Failure to provide the required materials on or before the application deadline will delay your application.

| Materials to be Provided by Applicant |                                                                                                                                          |                                |         |         |     |       |                         |                            |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|---------|-----|-------|-------------------------|----------------------------|
| Submittal Requirements                |                                                                                                                                          | Paper Copy – number and format |         |         | PDF | Notes | Required Submission (√) | Submitted by Applicant (√) |
|                                       |                                                                                                                                          | 8 ½ x11                        | 11 x 17 | 24 x 36 |     |       |                         |                            |
| 1                                     | <b>Planning Application</b> – completed in full and signed by applicant and all property owners of record                                |                                |         |         | √   |       | X                       |                            |
| 2                                     | <b>Ownership</b> - provide proof of ownership such as Deed of Trust, Warranty Deed or Quit Claim Deed. Title commitment will not suffice |                                |         |         | √   |       | X                       |                            |
| 3                                     | <b>Project Description</b> – narrative describing the project                                                                            |                                |         |         | √   |       | X                       |                            |
| 4                                     | <b>Administrative Adjustment Request</b> – refer to Administrative Adjustment information, criteria and questionnaire                    |                                |         |         | √   |       |                         |                            |

| Materials to be Provided by Applicant |                                                                                                                                                                                                                                                                                       |                                |         |         |     |                                                                                                                                                     |                           |                              |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|---------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------|
| Submittal Requirements                |                                                                                                                                                                                                                                                                                       | Paper Copy – number and format |         |         | PDF | Notes                                                                                                                                               | Required Submission ( ✓ ) | Submitted by Applicant ( ✓ ) |
|                                       |                                                                                                                                                                                                                                                                                       | 8 ½ x11                        | 11 x 17 | 24 x 36 |     |                                                                                                                                                     |                           |                              |
|                                       | page 11                                                                                                                                                                                                                                                                               |                                |         |         |     |                                                                                                                                                     |                           |                              |
| 5                                     | <b>Complete Plan Set including:</b>                                                                                                                                                                                                                                                   |                                |         |         | ✓   |                                                                                                                                                     |                           |                              |
|                                       | Cover Sheet                                                                                                                                                                                                                                                                           |                                |         |         |     |                                                                                                                                                     | X                         |                              |
|                                       | Site Plan                                                                                                                                                                                                                                                                             |                                |         |         |     |                                                                                                                                                     | X                         |                              |
| 6                                     | <b>Plat-</b> refer to Plat detail sheet page 7 for information required in the plat including format of certifications                                                                                                                                                                |                                |         |         | ✓   | Submit pdf of plat. Once approved and finalized, submit two 24 x 36 inch mylar copies for recording.                                                | X                         |                              |
| 7                                     | <b>Covenants &amp; Declarations and HOA By-laws, Draft</b>                                                                                                                                                                                                                            |                                |         |         |     |                                                                                                                                                     | NA                        |                              |
| 8                                     | <b>Maintenance Agreements, Draft-</b><br>Maintenance agreements will be required for all existing drainage facilities as well as other improvements that, if improperly maintained, may have an impact on surrounding properties. Refer to Engineering Standards for agreement format |                                |         |         |     |                                                                                                                                                     | NA                        |                              |
| 9                                     | <b>Fee</b>                                                                                                                                                                                                                                                                            | \$ 440                         |         |         |     | Cash, check or credit card. Check payable to the City of Glenwood Springs. Credit card or echeck payments can be made through the on-line portal at | X                         |                              |

| Materials to be Provided by Applicant |                                                  |                                |         |         |     |                                                                                                                                                                    |                         |                            |
|---------------------------------------|--------------------------------------------------|--------------------------------|---------|---------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|
| Submittal Requirements                |                                                  | Paper Copy – number and format |         |         | PDF | Notes                                                                                                                                                              | Required Submission (✓) | Submitted by Applicant (✓) |
|                                       |                                                  | 8 ½ x11                        | 11 x 17 | 24 x 36 |     |                                                                                                                                                                    |                         |                            |
|                                       |                                                  |                                |         |         |     | <a href="https://cogs.us/470/4409/Using-a-CreditDebit-Card-or-E-Check">https://cogs.us/470/4409/Using-a-CreditDebit-Card-or-E-Check</a>                            |                         |                            |
| 10                                    | <b>Other Materials</b>                           |                                |         |         |     |                                                                                                                                                                    |                         |                            |
|                                       | Check for recording the boundary adjustment plat |                                |         |         |     | Make check payable to Garfield County Clerk & Recorder<br>The fee depends on the number of plat sheets: \$13 for the first page and \$10 for each page thereafter. | X                       |                            |
|                                       |                                                  |                                |         |         |     |                                                                                                                                                                    |                         |                            |
|                                       |                                                  |                                |         |         |     |                                                                                                                                                                    |                         |                            |
|                                       |                                                  |                                |         |         |     |                                                                                                                                                                    |                         |                            |

## **Plat- Detail Sheet**

Plats must include the information listed below to be considered complete. During the Pre-application meeting, City Staff may request additional items.

| <b>General Plan Items (to be included on all plat sheets)</b> |     |                                                                                                                                                                                                                                                                                                                                                                              |            |     |
|---------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Applicant                                                     |     |                                                                                                                                                                                                                                                                                                                                                                              | City Staff |     |
| Yes                                                           | N/A |                                                                                                                                                                                                                                                                                                                                                                              | Yes        | N/A |
|                                                               |     | <b><u>General Formatting Requirements</u></b>                                                                                                                                                                                                                                                                                                                                |            |     |
|                                                               |     | Plat shall be drawn at a scale of 1"=100' or larger.                                                                                                                                                                                                                                                                                                                         |            |     |
|                                                               |     | Note basis of bearings & benchmarks. Bearing of all lines and central angle, tangent distance, chord distance and arc length of all curves shall be shown.                                                                                                                                                                                                                   |            |     |
|                                                               |     | All survey traverses shall close to an accuracy of at least within 1 foot in 10,000 feet.                                                                                                                                                                                                                                                                                    |            |     |
|                                                               |     | The boundary survey, internal property lines and monumentation as depicted on the preliminary plat shall meet all requirements established under state law.                                                                                                                                                                                                                  |            |     |
|                                                               |     |                                                                                                                                                                                                                                                                                                                                                                              |            |     |
|                                                               |     | <b><u>General Information to be included on all plat sheets:</u></b>                                                                                                                                                                                                                                                                                                         |            |     |
|                                                               |     | Name of subdivision or address; section, township, range; city, county and state.                                                                                                                                                                                                                                                                                            |            |     |
|                                                               |     | Page number (i.e. 1 of x, 2 of x, etc.)                                                                                                                                                                                                                                                                                                                                      |            |     |
|                                                               |     | Title block.                                                                                                                                                                                                                                                                                                                                                                 |            |     |
|                                                               |     | North arrow and indication of standardized scale, both fractional and bar (i.e. 1" = 20' or 1" = 40')                                                                                                                                                                                                                                                                        |            |     |
|                                                               |     | Date of preparation.                                                                                                                                                                                                                                                                                                                                                         |            |     |
|                                                               |     | Contact information for professional preparing plans including email address.                                                                                                                                                                                                                                                                                                |            |     |
|                                                               |     | Name, address, email, and telephone number of owner and applicant.                                                                                                                                                                                                                                                                                                           |            |     |
|                                                               |     |                                                                                                                                                                                                                                                                                                                                                                              |            |     |
|                                                               |     | <b><u>Project Information</u></b>                                                                                                                                                                                                                                                                                                                                            |            |     |
|                                                               |     | Include boundaries of the proposed subdivision. Provide tract, lot and block layouts with all lots numbered and sizes noted in square footage and acreage.                                                                                                                                                                                                                   |            |     |
|                                                               |     | Depict abutting subdivisions and lots and all abutting rights-of-way. Note width of streets. If abutting property is unplatted, include a note to that effect.                                                                                                                                                                                                               |            |     |
|                                                               |     | Include topography depicted in 2-foot contours.                                                                                                                                                                                                                                                                                                                              |            |     |
|                                                               |     | Provide a vicinity map showing at least three blocks on all sides of the proposed subdivision. Scale may be different than the plat.                                                                                                                                                                                                                                         |            |     |
|                                                               |     | Locate all existing buildings and structures, and other improvements in the area to be platted as well as within 10 feet of the proposed plat boundary. Structures and improvements include but are not exclusive of retaining walls, fences, circulation systems (sidewalks, trails, roadways); parking areas & driveway locations; and trees of 6 inch caliper and larger. |            |     |
|                                                               |     | Depict the location and size of existing utilities within or adjacent to the proposed subdivision including water, wastewater, storm sewers, fire hydrants, drainage facilities, telephone, electric, fiber, and gas.                                                                                                                                                        |            |     |
|                                                               |     | Depict setback restrictions where they deviate from zone district standards.                                                                                                                                                                                                                                                                                                 |            |     |
|                                                               |     | Provide floodways and floodplain boundaries, if applicable.                                                                                                                                                                                                                                                                                                                  |            |     |
|                                                               |     | Include a street plan which shows connections to existing rights-of-way. Depict width and name of public and private streets.                                                                                                                                                                                                                                                |            |     |
|                                                               |     | Label all existing and proposed public easements. Provide width and purpose of easement (utility, access, etc.). Label the location of all other areas to be dedicated for public use.                                                                                                                                                                                       |            |     |



|  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |
|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | Include on page 1 of the plat a FEMA floodplain statement including community map number and date. Indicate whether any part of the proposed subdivision is located within a designated floodplain.                                                                                                                                                                                                                                                                                                                                 |  |  |
|  |  | Include on page 1 of the plat the following geologic hazards disclosure, if applicable: "This property is subject to geologic hazards per the adopted mapping by the City of Glenwood Springs. Hazards to note are _____. A final Geologic Hazard Report will be submitted upon application of a building permit.                                                                                                                                                                                                                   |  |  |
|  |  | Include on page 1 of the plat if any lot within the proposed subdivision is located within an airport overlay zone: "The aviation easement dedicated herein for public aviation purposes, shall be considered a public easement subject to those terms and conditions specified on the instrument recorded at _____ of the records of Garfield County, Colorado. All other easements or interests of record affecting any of the platted property depicted hereon shall not be affected and shall remain in full force and effect." |  |  |

| Certifications |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |     |
|----------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Applicant      |     | Plats shall contain the following certifications, as applicable. Wording is provided for general guidance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | City Staff |     |
| Yes            | N/A |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Yes        | N/A |
|                |     | <p><b>CLERK AND RECORDER'S CERTIFICATE:</b></p> <p>This plat was filed for record in the office of the Clerk and Recorder of Garfield County at _____ o'clock __M on the ____ day of _____ 20__, as Reception No. _____.</p> <p>_____<br/>Clerk and Recorder</p> <p>By _____<br/>Deputy</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |     |
|                |     | <p><b>SURVEYOR'S CERTIFICATE</b></p> <p>I, _____, do hereby certify that I am a registered land surveyor licensed under the laws of the State of Colorado, that this plat is a true, correct and complete plat of the _____ as laid out, platted, dedicated and shown hereon, that such plat was made from an accurate survey of said property by me and under my supervision and correctly shows the location and dimensions of the lots, easements and streets of said subdivision as the same are staked upon the ground in compliance with the City of Glenwood Springs regulations governing the subdivision of land</p> <p>In witness whereof I have set my hand and seal this ____ day of ____ A.D. 20__.</p> <p>_____<br/>Registered Land Surveyor</p>                                                                                             |            |     |
|                |     | <p><b>CERTIFICATE OF DEDICATION AND OWNERSHIP</b></p> <p>Know all men by these presents that _____, being sole owners in fee simple of all that real property described as follows: _____ and containing ____ acres, more or less; have by these presents laid out, platted and subdivided the same into lots and blocks as shown hereon and designate the same as _____ in the City of Glenwood springs, County of Garfield, Colorado; and do hereby grant to the City of Glenwood Springs, County of Garfield, Colorado, for public use the streets shown hereon, including avenues, drives, courts, places and alleys, the public lands shown hereon for their indicated public use, and the utility and drainage easements shown hereon for utility and drainage purposes only; and so further state that this subdivision shall be subject to the</p> |            |     |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  | <p>protective covenants filed and recorded for this subdivision in the office of the Clerk and Recorder of Garfield County, Colorado as Reception No. _____, and subject to the Subdivision Agreement filed and recorded for this subdivision in the office of the Clerk and Recorder of Garfield County, Colorado as Reception No. _____.</p> <p>EXECUTED this ____ day of _____, A.D. 20__.</p> <p>Owners _____</p> <p>STATE OF _____</p> <p>COUNTY OF _____</p> <p>The foregoing dedication was acknowledged before me this ____ day of _____, A.D. 20__, by _____.</p> <p>My commission expires _____.</p> <p>WITNESS MY HAND AND SEAL,</p> <p>_____<br/>Notary Public</p> |  |  |
|  | <p>COMMUNITY DEVELOPMENT DIRECTOR CERTIFICATE:</p> <p>This plat was approved by the City of Glenwood Springs Director of Community Development this ____ day of _____, A.D. 20__.</p> <p>_____<br/>Director</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |

| Recording Formatting – Final Plat & Related Documents |     |            |     |  |
|-------------------------------------------------------|-----|------------|-----|--|
| Applicant                                             |     | City Staff |     |  |
| Yes                                                   | N/A | Yes        | N/A |  |
|                                                       |     |            |     |  |
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## Administrative Adjustment

### **OVERVIEW**

An Administrative Adjustment allows the Community Development Director, Planning and Zoning Commission and/or City Council to review and approve minor modifications or deviations from the dimensional or numeric standards of Title 070-the Development Code. The process is intended to provide greater flexibility when necessary, without requiring a formal zoning amendment or variance. Administrative adjustment can be considered for the following Code standards:

| Allowable Administrative Adjustments                                                                                 |                                                             |
|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Code Standard                                                                                                        | Allowable Administrative Adjustment<br>(maximum percentage) |
| <b>Site Standards</b>                                                                                                |                                                             |
| Lot area, minimum                                                                                                    | 15                                                          |
| Lot coverage, maximum                                                                                                | 15                                                          |
| Block length, maximum                                                                                                | 15                                                          |
| <b>Lot Dimensional Standards</b>                                                                                     |                                                             |
| Front setback, minimum                                                                                               | 15                                                          |
| Side setback, minimum                                                                                                | 15                                                          |
| Rear setback, minimum                                                                                                | 15                                                          |
| Encroachment into setback pursuant to Table 020.20, Authorized Exceptions to Setback Standards, maximum              | 15                                                          |
| <b>Building Standards</b>                                                                                            |                                                             |
| Building height, maximum<br>(excludes wireless communication facilities)                                             | 15                                                          |
| Accessory building height, maximum<br>(excludes wireless communication facilities)                                   | 15                                                          |
| Separation between buildings, minimum                                                                                | 15                                                          |
| Projection into height requirement pursuant Table 020.21, Authorized Exceptions to Maximum Height Standards, maximum | 15                                                          |
| <b>Development Standards</b>                                                                                         |                                                             |
| Number of required parking spaces, maximum or minimum                                                                | 15                                                          |
| Lighting height, maximum                                                                                             | 15                                                          |
| Sign height, maximum                                                                                                 | 15                                                          |
| Fence or wall height, maximum                                                                                        | 15 (one foot maximum)                                       |
| Minimum landscaping requirements                                                                                     | 15                                                          |

The Administrative Adjustment process cannot be applied to proposed modifications or deviations that result in the following:

1. An increase in the overall project density;
2. A change in permitted uses or mix of uses;
3. A deviation from the Use-specific Standards in 070.030.030 of the Municipal Code;
4. A deviation from Sensitive Area Protection Standards in 070.040.020 of the Municipal Code;
5. A deviation from building or fire codes;

6. A deviation from the City's Engineering Standards;
7. Requirements for public roadways, utilities, or other public infrastructure or facilities; or
8. A change to a development standard where that same standard was already modified through a separate administrative adjustment or variance.

#### **REVIEW CRITERIA**

The Community Development Director, Planning and Zoning Commission, and/or City Council will evaluate your application based on whether and to what extent your adjustment:

1. Will not result in incompatible development;
2. Will not result in adverse impacts unless adequately mitigated; and
3. Is of a technical nature and is required to-
  - a. Compensate for an unusual site condition;
  - b. Eliminate a minor inadvertent failure to comply with a Code standard; or
  - c. Protect a sensitive resource, natural feature, or community asset.

#### **INSTRUCTIONS**

1. Complete the questionnaire on pages 13-14 after you have had your pre-application conference. Use one questionnaire for each adjustment you are requesting. Once completed, submit the Administrative Adjustment questionnaire(s) along with the other items on your checklist. Use separate sheets if necessary.
2. It is important to remember that the decision to approve or deny an adjustment is a discretionary action based on how well you address the review criteria. This is your opportunity to describe in detail the reason why you need to deviate from the Municipal Code.

## Administrative Adjustment Criteria

### Adjustment type

Explain what it is that you are proposing that does not meet the Municipal Code requirement.

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### Administrative Adjustment Criteria

1. Explain how your request will not result in incompatible development. \_\_\_\_\_

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2. Explain how the adjustment will not result in, or how you have mitigated any adverse impacts. \_\_\_\_\_

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3. Explain how the adjustment is necessary to compensate for an unusual site condition. \_\_\_\_\_

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4. Explain how the adjustment is necessary to eliminate a minor inadvertent failure to comply with the Municipal Code. \_\_\_\_\_

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5. Explain how the adjustment is necessary to protect a sensitive resource, natural feature, or community asset. \_\_\_\_\_

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## **Special Use Permit Application Guide & Checklist**

Economic & Community Development Department  
101 W. 8<sup>th</sup> Street  
Glenwood Springs, CO 81601  
(970) 384-6411

### **PURPOSE**

Special use permit review procedures allow the City to evaluate proposed development and land uses that have unique or widely varying operating characteristics or unusual features. The review process is intended to ensure compatibility with surrounding areas and that adequate mitigation is provided for anticipated impacts.

### **REVIEW PROCESS**

All Special Use Permits require an application and public hearing before the Planning and Zoning Commission. In reviewing a proposed special use permit application, the Planning Commission considers whether:

- a. The use will be compatible with the surrounding area;
- b. The impacts of the use on surrounding areas have been adequately minimized;
- c. The use will be consistent with the general purpose and intent of this Code;
- d. The use will comply with all applicable standards of this Code;
- e. The use is in conformance with the Comprehensive Plan and other City plans and policies; and
- f. The use minimizes adverse impacts to the health, safety, and welfare of the inhabitants of the surrounding areas and the city.

Additional criteria for specific uses are listed in Section 070.030.030. Note: for uses involving marijuana establishments refer to the Marijuana Special Review Use Application Guide and Checklist.

- 1. Pre-application Conference.** Contact one of the planners in the Community Development Department prior to submitting your Special Use Permit application. We will discuss the review procedures, application requirements, application deadlines, and the City's goals, policies, and development standards as they relate to your proposed project.

At least 10 days prior to your scheduled conference, please submit one electronic copy of the following items:

- a. A completed Planning Application. The application is available [here](#), or on the City's website at [www.cogs.us](http://www.cogs.us). It is in "Forms, Permits & Applications" on the Community Development Department page.

- b. A written description of the proposed project.
- c. Conceptual drawings showing the location, layout, and primary elements of the proposal.
- d. Proposed uses, location of uses, and densities.

If your project involves more than one development action for the same property, your applications can be reviewed concurrently. For example, if your proposed project involves a Site/Architectural Plan Review, variances, and special use permit, you could have them processed and decided concurrently. Community Development Department planners will discuss the concurrent review process and application requirements with you during your pre-application conference.

- 2. Prepare Your Application.** During the pre-application conference you will receive a checklist of information that we will need to process your request. This information constitutes your application and may include any, or all the information found on page 7 of this guide.

Please be aware that city staff and the Planning and Zoning Commission will evaluate your application based on how well it demonstrates compliance with the Municipal Code, Special Review performance standards, and the City's goals, policies, and plans, as well as the Engineering Standards if your project involves grading/excavation or building construction.

You may review the Municipal Code on the City's website at [www.cogs.us](http://www.cogs.us). The Engineering Standards are located [here](#), or on the Engineering home page. Other approved plans also can be found on the City's website under the individual department pages. Community Development staff will help guide you to plans and policies that may be applicable to your project.

- 3. Submit Your Application.** Submit an electronic copy of your completed application to the Community Development Department at least 8 weeks prior to the date that you want your item heard before the Planning and Zoning Commission. Within 5 business days of your submission, Community Development Department staff will review your application to determine whether it is complete. If it is incomplete, we will contact you with a list of the information needed to complete your application. You are encouraged to submit your application well in advance of the deadline to allow you time to supply any missing information. Submissions of missing information after the deadline will result in your application being delayed to a future Planning and Zoning Commission agenda.
- 4. Provide Additional Copies.** After Community Development Department staff deems it complete, you will be asked to supply a final, complete electronic set of your application materials as well as paper copies for distribution to the City's reviewing departments and outside agencies. The number of paper copies can vary depending upon the scope of your

application. The paper format of your submission may vary. If your application includes any full-sized plan sheets, we may request submission on 11" x 17" or 24" x 36" size paper.

- 5. Complete Public Notices.** Your application requires that you formally notify the public of the time, date and purpose of your hearing before the Planning and Zoning Commission. You are required to post your property with a placard, submit a legal notice for publication in the local newspaper, and mail your notice to property owners within 300 feet of the outside boundary of your development parcel. Staff will review these requirements and will provide you with a packet of information that includes the deadlines for completing each form of public notice. This is a time-sensitive process. Deficient public noticing may delay your hearing.
- 6. Agency Referral and Review.** During the 8-week period between your application submittal and your hearing, staff will distribute copies of your application to our "reviewing agencies" which consists of various City departments, City boards and commissions, and outside agencies such as the Colorado Department of Transportation, and gas and telephone companies. Community Development Department staff relies on these agencies to review your application and comment on any issues or concerns that they may have relating to your project. You will receive copies of agency comments and will have an opportunity to respond, if need be. In some instances, agency comments may cause you to redesign your project. Staff will include these comments in the packet of information that is distributed to the Planning and Zoning Commission.
- 7. City Department/Applicant Development Review Committee Meeting.** Generally, three weeks prior to your public hearing you will meet with City Departments, and planning staff to review and discuss their preliminary comments about your project. Following this meeting, you may be required to revise your plans to respond to specific requests or suggestions made by staff. If significant, substantive changes are necessary you will be required to submit a new application in which case your hearing will be postponed
- 8. Staff Review & Report.** Toward the end of the 8-week review of your application materials, Community Development Department staff will prepare a report for the Planning and Zoning Commission meeting that analyzes how your project meets the Municipal Code, the City's goals, policies, and plans, and any other pertinent information. The report will include a staff recommendation of approval, denial, or continuance of your application. If staff recommends approval, usually there also will be a list of recommended conditions. Staff will complete the report no later than the Friday afternoon prior to the hearing. You will receive a copy, usually via email. Make sure that you read the report and review the listed conditions, if there are any. Staff will also distribute the report, a complete copy of your application, and agency comments to the Planning and Zoning Commission for its review.
- 9. Requesting a Continuance.** If, after reading the staff report, you wish to continue your application to the next month's Planning and Zoning Commission meeting to correct

deficiencies or clear up issues in the application, you will need to submit a letter to Community Development Department staff requesting continuance of your hearing. If you do this, you will not need to appear at the meeting or redo your public noticing, and no comments will be made by the City or public regarding your application at the hearing.

**10. Planning and Zoning Commission Hearing.** Staff will provide you with a copy of the meeting agenda no later than the Friday before your hearing. Applications are scheduled on the agenda based on the order in which they are received. You or your representative are required to attend your public hearing.

**11. Post-approval-Special Use Permit Issuance.** After you have satisfied any applicable conditions of your project's approval, Community Development Department staff will work with the City's Legal Department to prepare your Special Use Permit. You will receive the draft permit for your review and signature after which your staff planner will collect the required city signatures. Once the document is fully executed, you will receive a copy for your records.

**12. Post-approval Plan Modifications.** Please make sure that your plans reflect how you intend to use or develop your property. After your application has been approved, if you want to make significant changes you may be required to formally amend your application which involves additional hearings before the Planning & Zoning Commission.

#### **PUBLIC MEETING PROCEDURES**

The public hearing format is as follows:

1. Staff Presentation. Staff will provide the Commission with a summary of your project and an analysis of how it meets or differs from the Municipal Code and other city plans and standards.
2. Questions of staff by the Planning and Zoning Commission.
3. Applicant Presentation. This is your opportunity to present any additional information about your project to the Commission. You can mention points where you disagree with staff, present anything important that you felt that planning staff left out, present any new information that you have, or present any other information directly pertinent to the application. Out of respect for the Commission and other applicants, please keep presentations very brief. If you have no additional important information to add to staff's presentation, you may state this.
4. Questions of the applicant by the Commission.
5. Public Comment. The Commission Chair will open the meeting to public comment.
6. Applicant response to public comment. After hearing from all members of the public, the Chair will close the public portion of the meeting and allow you the opportunity to refute or address any statements provided. At this time, the Commission may also ask staff for clarification of any points of fact.

7. Motion for action on the application, discussion among the Commissioners, and a decision.

**Display of documents at the meeting.** You may use the Council Chambers computer to display any documents or to provide the Commission and Council with a prepared presentation. We recommend that you bring your materials on a flash drive.

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## SPECIAL USE PERMIT APPLICATION CHECKLIST

*For office use:*

Pre-application Meeting Date: \_\_\_\_\_

Planning File #: \_\_\_\_\_

Applicant: \_\_\_\_\_

Lead Planner: \_\_\_\_\_

During or shortly following your pre-application meeting, you will receive this checklist noting the materials that the City will need to process your special use permit application. This information constitutes your application. Failure to provide the required materials on or before the application deadline will delay your application.

| Materials to be Provided by Applicant |                                                                                                                                                                                                                                              |                                |         |         |     |                                 |                         |                            |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|---------|-----|---------------------------------|-------------------------|----------------------------|
| Submittal Requirements                |                                                                                                                                                                                                                                              | Paper Copy – number and format |         |         | PDF | Notes                           | Required Submission (√) | Submitted by Applicant (√) |
|                                       |                                                                                                                                                                                                                                              | 8 ½ x11                        | 11 x 17 | 24 x 36 |     |                                 |                         |                            |
| 1                                     | <b>Planning Application</b> – completed in full and signed by applicant and all property owners of record                                                                                                                                    |                                |         |         | √   |                                 |                         |                            |
| 2                                     | <b>Ownership</b> - provide proof of ownership such as Deed of Trust, Warranty Deed or Quit Claim Deed. Title commitment will not suffice                                                                                                     |                                |         |         | √   |                                 |                         |                            |
| 3                                     | <b>Public Noticing</b> – signed and notarized affidavit proof of public notice including mineral estate owner notification                                                                                                                   |                                |         |         |     | Refer to Public Noticing Packet |                         |                            |
| 4                                     | <b>Project Description</b> – narrative describing the project and addressing how the application meets the general Special Use permit approval criteria page 1 of this guide and any applicable use-specific standards listed in 070.030.030 |                                |         |         | √   |                                 |                         |                            |
| 5                                     | <b>Administrative Adjustment Request</b> – refer to Administrative Adjustment information, criteria and questionnaire page 11                                                                                                                |                                |         |         | √   |                                 |                         |                            |

| Materials to be Provided by Applicant |                                                                                                                                                                  |                                |         |         |     |                                                                           |                           |                              |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------|---------|-----|---------------------------------------------------------------------------|---------------------------|------------------------------|
| Submittal Requirements                |                                                                                                                                                                  | Paper Copy – number and format |         |         | PDF | Notes                                                                     | Required Submission ( ✓ ) | Submitted by Applicant ( ✓ ) |
|                                       |                                                                                                                                                                  | 8 ½ x11                        | 11 x 17 | 24 x 36 |     |                                                                           |                           |                              |
| 6                                     | <b>Variance</b> – refer to Variance criteria and questionnaire page 15                                                                                           |                                |         |         |     |                                                                           |                           |                              |
| 7                                     | <b>Site Improvement Survey</b>                                                                                                                                   |                                |         |         | ✓   |                                                                           |                           |                              |
| 8                                     | <b>Complete Plan Set including:</b>                                                                                                                              |                                |         |         | ✓   |                                                                           |                           |                              |
|                                       | Cover Sheet                                                                                                                                                      |                                |         |         |     |                                                                           |                           |                              |
|                                       | Site Plan                                                                                                                                                        |                                |         |         |     |                                                                           |                           |                              |
|                                       | Preliminary Grading Plan                                                                                                                                         |                                |         |         |     |                                                                           |                           |                              |
|                                       | Preliminary Utility Plan                                                                                                                                         |                                |         |         |     |                                                                           |                           |                              |
|                                       | Conceptual Architectural Plans                                                                                                                                   |                                |         |         |     |                                                                           |                           |                              |
|                                       | Preliminary Landscape Plan                                                                                                                                       |                                |         |         |     |                                                                           |                           |                              |
|                                       | Sample materials board                                                                                                                                           |                                |         |         |     |                                                                           |                           |                              |
|                                       | Lighting Plan                                                                                                                                                    |                                |         |         |     |                                                                           |                           |                              |
| 9                                     | <b>Engineering Reports including:</b>                                                                                                                            |                                |         |         | ✓   |                                                                           |                           |                              |
|                                       | Preliminary Traffic Impact Analysis or Letter – the level of documentation required depends on the location of the property and the type of development proposed |                                |         |         |     |                                                                           |                           |                              |
|                                       | Preliminary Soils & Geotechnical Report                                                                                                                          |                                |         |         |     |                                                                           |                           |                              |
|                                       | Drainage Letter or Study – level of information required depends on the project location, size and type of development. Refer to Engineering Standards           |                                |         |         |     |                                                                           |                           |                              |
| 10                                    | <b>Fee</b>                                                                                                                                                       | \$ _____                       |         |         |     | Cash, check or credit card. Check payable to the City of Glenwood Springs |                           |                              |



| Materials to be Provided by Applicant |                                                                     |                                |         |         |     |       |                           |                              |
|---------------------------------------|---------------------------------------------------------------------|--------------------------------|---------|---------|-----|-------|---------------------------|------------------------------|
| Submittal Requirements                |                                                                     | Paper Copy – number and format |         |         | PDF | Notes | Required Submission ( ✓ ) | Submitted by Applicant ( ✓ ) |
|                                       |                                                                     | 8 ½ x11                        | 11 x 17 | 24 x 36 |     |       |                           |                              |
|                                       |                                                                     |                                |         |         |     |       |                           |                              |
| 11                                    | <b>Other Materials</b> (list other materials that will be required) |                                |         |         |     |       |                           |                              |
|                                       |                                                                     |                                |         |         |     |       |                           |                              |
|                                       |                                                                     |                                |         |         |     |       |                           |                              |
|                                       |                                                                     |                                |         |         |     |       |                           |                              |
|                                       |                                                                     |                                |         |         |     |       |                           |                              |

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## Administrative Adjustment

### **OVERVIEW**

An Administrative Adjustment allows the Community Development Director, Planning and Zoning Commission and/or City Council to review and approve minor modifications or deviations from the dimensional or numeric standards of Title 070-the Development Code. The process is intended to provide greater flexibility when necessary, without requiring a formal zoning amendment or variance. Administrative adjustment can be considered for the following Code standards:

| <b>Allowable Administrative Adjustments</b>                                                                             |                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>Code Standard</b>                                                                                                    | <b>Allowable Administrative Adjustment<br/>(maximum percentage)</b> |
| <b>Site Standards</b>                                                                                                   |                                                                     |
| Lot area, minimum                                                                                                       | 15                                                                  |
| Lot coverage, maximum                                                                                                   | 15                                                                  |
| Block length, maximum                                                                                                   | 15                                                                  |
| <b>Lot Dimensional Standards</b>                                                                                        |                                                                     |
| Front setback, minimum                                                                                                  | 15                                                                  |
| Side setback, minimum                                                                                                   | 15                                                                  |
| Rear setback, minimum                                                                                                   | 15                                                                  |
| Encroachment into setback pursuant to Table 020.20, Authorized Exceptions to Setback Standards, maximum                 | 15                                                                  |
| <b>Building Standards</b>                                                                                               |                                                                     |
| Building height, maximum<br>(excludes wireless communication facilities)                                                | 15                                                                  |
| Accessory building height, maximum<br>(excludes wireless communication facilities)                                      | 15                                                                  |
| Separation between buildings, minimum                                                                                   | 15                                                                  |
| Projection into height requirement pursuant Table 020.21,<br>Authorized Exceptions to Maximum Height Standards, maximum | 15                                                                  |
| <b>Development Standards</b>                                                                                            |                                                                     |
| Number of required parking spaces, maximum or minimum                                                                   | 15                                                                  |
| Lighting height, maximum                                                                                                | 15                                                                  |
| Sign height, maximum                                                                                                    | 15                                                                  |
| Fence or wall height, maximum                                                                                           | 15 (one foot maximum)                                               |
| Minimum landscaping requirements                                                                                        | 15                                                                  |

The Administrative Adjustment process cannot be applied to proposed modifications or deviations that result in the following:

1. An increase in the overall project density;
2. A change in permitted uses or mix of uses;
3. A deviation from the Use-specific Standards in 070.030.030 of the Municipal Code;
4. A deviation from Sensitive Area Protection Standards in 070.040.020 of the Municipal Code;
5. A deviation from building or fire codes;

6. A deviation from the City's Engineering Standards;
7. Requirements for public roadways, utilities, or other public infrastructure or facilities; or
8. A change to a development standard where that same standard was already modified through a separate administrative adjustment or variance.

#### **REVIEW CRITERIA**

The Community Development Director, Planning and Zoning Commission, and/or City Council will evaluate your application based on whether and to what extent your adjustment:

1. Will not result in incompatible development;
2. Will not result in adverse impacts unless adequately mitigated; and
3. Is of a technical nature and is required to-
  - a. Compensate for an unusual site condition;
  - b. Eliminate a minor inadvertent failure to comply with a Code standard; or
  - c. Protect a sensitive resource, natural feature, or community asset.

#### **INSTRUCTIONS**

1. Complete the questionnaire on pages 13-14 after you have had your pre-application conference. Use one questionnaire for each adjustment you are requesting. Once completed, submit the Administrative Adjustment questionnaire(s) along with the other items on your checklist. Use separate sheets if necessary.
2. It is important to remember that the decision to approve or deny an adjustment is a discretionary action based on how well you address the review criteria. This is your opportunity to describe in detail the reason why you need to deviate from the Municipal Code.

## Administrative Adjustment Criteria

### Adjustment type

Explain what it is that you are proposing that does not meet the Municipal Code requirement.

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### Administrative Adjustment Criteria

1. Explain how your request will not result in incompatible development. \_\_\_\_\_

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2. Explain how the adjustment will not result in, or how you have mitigated any adverse impacts. \_\_\_\_\_

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3. Explain how the adjustment is necessary to compensate for an unusual site condition. \_\_\_\_\_

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4. Explain how the adjustment is necessary to eliminate a minor inadvertent failure to comply with the Municipal Code. \_\_\_\_\_

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5. Explain how the adjustment is necessary to protect a sensitive resource, natural feature, or community asset. \_\_\_\_\_

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## Variance Criteria

If your application includes a request to deviate from a Municipal Code requirement you must address how your variance request meets all the criteria listed below.

### Instructions

1. Use this questionnaire if your project includes variances, which are deviations from Municipal Code requirements. Examples include deviations from setback requirements, building height maximums, design standards, minimum number of off-street parking spaces, and permitted light levels.
2. Complete this questionnaire after you have had your pre-application conference. Once completed, submit this questionnaire along with the other items on the checklist. Complete one questionnaire for each variance you are requesting. Use a separate sheet if necessary.
3. It is important to remember that the decision to approve or deny a variance is a discretionary action based on how well you meet all the variance criteria. This is your opportunity to describe in detail the reason why you need to deviate from the Municipal Code. If you are unable to provide justification of how your application meets each of the criteria below, you may want to consider whether a variance is truly warranted.

### Variance type

**Explain what Municipal Code requirement you are requesting a variance from and what it is that you are proposing that does not meet this requirement.**

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### Variance Criteria

1. **Explain how your property has an exceptional shape, topography, building configuration or other exceptional site condition that is not a general condition throughout the zone district.** \_\_\_\_\_

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2. Explain how the strict application of the Code standards for the variance you are seeking produces undue hardship. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Explain how you did not create the hardship by your own actions. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Explain how the requested variance does not harm the public and does not impair the intent or purposes of this Code, goals, and policies, including the specific regulation in question. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Explain how the variance request demonstrates exceptional hardship not related to purposes of convenience or financial burden. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. Explain how the variance request will not violate building or fire code requirements. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



7. Explain how the variance is the minimum variance that will afford relief of the subject standards of the Code. \_\_\_\_\_

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 Glenwood Springs, CO 81601  
 (970) 384-6411

### Complete Plan Set: Cover Sheet

The cover sheet must include the information listed below to be considered complete. During the Pre-application Meeting, City Staff may request additional items.

| General Plan Items (to be included on all sheets) |     |                                                                                                                                             |            |     |
|---------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Applicant                                         |     |                                                                                                                                             | City Staff |     |
| Yes                                               | N/A |                                                                                                                                             | Yes        | N/A |
|                                                   |     | <b><u>Formatting Requirements:</u></b>                                                                                                      |            |     |
|                                                   |     | All drawings shall be submitted in both hard copy and electronic (PDF) formats.                                                             |            |     |
|                                                   |     | Sheet sizes shall be a minimum of 11" x 17" and a maximum of 24" x 36" with a ½" border in landscape orientation.                           |            |     |
|                                                   |     | Symbols and line types shall comply with industry drafting standards and shall graphically distinguish between existing and proposed items. |            |     |
|                                                   |     | Text shall be no less than 0.1 inch in height.                                                                                              |            |     |
|                                                   |     | Property boundary lines of the subject property shall be depicted with a bold "phantom" linetype.                                           |            |     |
|                                                   |     | Utilize match lines to connect information from drawings.                                                                                   |            |     |
|                                                   |     | <b><u>General Information to be included on all civil sheets:</u></b>                                                                       |            |     |
|                                                   |     | Name of subdivision or address; section, township, range; city, county and state.                                                           |            |     |
|                                                   |     | Page number (i.e. 1 of x, 2 of x, etc.)                                                                                                     |            |     |
|                                                   |     | Title block.                                                                                                                                |            |     |
|                                                   |     | North arrow and indication of standardized scale, both fractional and bar (i.e. 1" = 20' or 1" = 40')                                       |            |     |
|                                                   |     | Date of preparation.                                                                                                                        |            |     |
|                                                   |     | Contact information for professional preparing plans including email address.                                                               |            |     |
|                                                   |     | Name, address, email, and telephone number of owner and applicant.                                                                          |            |     |

| Cover Sheet |     |                                                                                                                                                                                                                                                        |            |     |
|-------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Applicant   |     |                                                                                                                                                                                                                                                        | City Staff |     |
| Yes         | N/A |                                                                                                                                                                                                                                                        | Yes        | N/A |
|             |     | Vicinity map.                                                                                                                                                                                                                                          |            |     |
|             |     | Basis of bearings & benchmarks.                                                                                                                                                                                                                        |            |     |
|             |     | FEMA floodplain statement including community map number and date. Indicate whether the site is located within a designated floodplain.                                                                                                                |            |     |
|             |     | Geologic hazards disclosure. "This property is subject to geologic hazards per the adopted mapping by the City of Glenwood Springs. Hazards to note are _____. A final Geologic Hazard Report will be submitted upon application of a building permit. |            |     |
|             |     | If property is located within an airport overlay zone, the following note must be included                                                                                                                                                             |            |     |

|  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | on the cover sheet: "The avigation easement dedicated herein for public avigation purposes, shall be considered a public easement subject to those terms and conditions specified on the instrument recorded at _____ of the records of Garfield County, Colorado. All other easements or interests of record affecting any of the platted property depicted hereon shall not be affected and shall remain in full force and effect." |  |  |
|  |  | Index for all sheets included in submittal set.                                                                                                                                                                                                                                                                                                                                                                                       |  |  |
|  |  | <b>Public Facilities</b> – A note shall be placed on the site plan that makes reference to the public facility requirements for the installation and construction and/or contributions.                                                                                                                                                                                                                                               |  |  |
|  |  | <b>Project Summary Table</b> – Use the table format below to provide data about the proposed project. Make sure to complete all applicable cells.                                                                                                                                                                                                                                                                                     |  |  |

### Project Summary Table

| Project Description              |                           |                           |  |                                                   |                      |                            |
|----------------------------------|---------------------------|---------------------------|--|---------------------------------------------------|----------------------|----------------------------|
| <b>Lot Size Information</b>      | Acres                     | Square feet               |  | <b>Lot Coverage</b>                               | Existing (Sq Ft & %) | Proposed (Sq. Ft. & %)     |
|                                  |                           |                           |  |                                                   |                      |                            |
| <b>Limits of Disturbance</b>     | Existing (Sq & %)         | Proposed (Sq. Ft. & %)    |  | <b>Average Slope within Limits of Disturbance</b> | Percentage %         |                            |
|                                  |                           |                           |  |                                                   |                      |                            |
| <b>Off-street Parking Spaces</b> | Existing # Vehicle Spaces | Proposed # Vehicle Spaces |  | <b>Bicycle Parking</b>                            | Existing # Spaces    | Proposed # Spaces          |
|                                  |                           |                           |  |                                                   |                      |                            |
| <b>Residential Units</b>         | # Existing Units          | # Proposed Units          |  | <b>Non-residential Uses</b>                       | Type of Use(s)       | Gross Floor Area (Sq. Ft.) |
|                                  |                           |                           |  |                                                   |                      |                            |
| <b>Open Space</b>                | Existing (Sq ft & %)      | Proposed (Sq Ft & %)      |  | <b>Total Landscaped area</b>                      | Existing (Sq Ft & %) | Proposed (Sq Ft & %)       |
|                                  |                           |                           |  |                                                   |                      |                            |
| <b>Building Height</b>           | Existing                  | Proposed                  |  | <b>Total Impervious Area</b>                      | Existing (Sq Ft & %) | Proposed (Sq Ft & %)       |
|                                  |                           |                           |  |                                                   |                      |                            |
| <b>Snow Storage</b>              | Required (sq ft)          | Proposed (sq ft)          |  | <b>Other</b>                                      |                      |                            |
|                                  |                           |                           |  |                                                   |                      |                            |



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### **Complete Plan Set: Site Plan**

The Site Plan must include the information listed below to be considered complete. During the Pre-application Meeting, City Staff may request additional items.

| <b>Site Plan</b> |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |            |
|------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------|
| <b>Applicant</b> |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>City Staff</b> |            |
| <b>Yes</b>       | <b>N/A</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Yes</b>        | <b>N/A</b> |
|                  |            | Depict existing and proposed improvements including, without limitation, all of the following: grading; circulation systems (sidewalks, trails, roadways); parking areas & driveway locations; floodways and floodplains; street lights; curbs & gutters; traffic signal poles and controllers; fire hydrant locations; pavement edges; open space; and landscaping.                                                                                                                                                                                                                                |                   |            |
|                  |            | Depict existing and proposed utilities (gas, electric, cable, fiber optics, raw water, water, sewer) and include sizing. Note: Depending on the amount of detail on the site plan, the utilities may be shown on a separate plan sheet.                                                                                                                                                                                                                                                                                                                                                             |                   |            |
|                  |            | Depict existing and proposed buildings and structures. Label uses and square footages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |            |
|                  |            | Depict existing and proposed circulation systems (sidewalks, trails, roadways, driveways, curb cuts, parking areas). Include widths and surface material information. Provide parking count, space dimensions, and identify all ADA parking spaces. Include curb return radii; ADA ramp locations; horizontal curve data; full width of right of way; intersecting roadways; street cross sections; and other relevant features along all roadways abutting the proposed development. Show bicycle parking location and quantity. Indicate all loading and vehicular stacking areas, as applicable. |                   |            |
|                  |            | Depict existing and proposed drainage facilities including inlets, manholes, and stormwater outfalls. Include directional drainage flow arrows.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |            |
|                  |            | Label all existing and proposed easements. Provide width and purpose of easement (utility, access, etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |            |
|                  |            | Indicate required setbacks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |            |
|                  |            | Indicate high water setback for developments bordering the Roaring Fork or Colorado rivers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |            |
|                  |            | Depict sight triangles for all access points.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |            |
|                  |            | Depict type, material, height for all fences and retaining walls. Label top and bottom of all retaining walls.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |            |
|                  |            | Depict trash enclosure locations. Provide enclosure material and height details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |            |
|                  |            | Label accessible route from the public right of way or primary access to the proposed building public entrance. Label distance from closest property line to the building.                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |            |
|                  |            | Label snow storage areas.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |            |



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### **Complete Plan Set: Grading Plan**

The Grading Plan must include the information listed below to be considered complete. Refer to the Engineering Standards for additional requirements. During the Pre-application Meeting, City Staff may request additional items.

| <b>Grading Plan</b> |     |                                                                                                                              |            |     |
|---------------------|-----|------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Applicant           |     |                                                                                                                              | City Staff |     |
| Yes                 | N/A |                                                                                                                              | Yes        | N/A |
|                     |     | Depict existing and proposed contours.                                                                                       |            |     |
|                     |     | Include limits of disturbance.                                                                                               |            |     |
|                     |     | Provide flow directions with arrows.                                                                                         |            |     |
|                     |     | Include cut and fill slopes. Cut and fill slopes shall not exceed 2:1 unless otherwise specified by the geotechnical report. |            |     |
|                     |     | Depict top and bottom of wall information for all retaining walls.                                                           |            |     |
|                     |     | Provide finished floor elevations.                                                                                           |            |     |
|                     |     | Provide and label all drainage easements for public storm drainage facilities located on private property.                   |            |     |



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### **Complete Plan Set: Preliminary Architectural Plans**

The Preliminary Architectural Plan must include the information listed below to be considered complete. During the Pre-application Meeting, City Staff may request additional items.

| <b>Preliminary Architectural Plan</b> |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
|---------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|--|--|--------------|--------------------|---------------|------------|----|-----------|------------|-----|----------------------------|------------|-----|--------------|----------|-----|--|--|
| Applicant                             |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | City Staff     |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
| Yes                                   | N/A          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Yes            | N/A |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
|                                       |              | Provide conceptual site plan depicting location of building, parking areas, access/driveways, building entrances, easements, setbacks and all site improvements including but not exclusive of trash/dumpsters, bicycle parking facilities, landscaped areas, and retaining walls/fences. Site plan shall include contours with elevations noted. Show and label limits of site disturbance.                                                                                                                                                                                                                                                                                                                                                                 |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
|                                       |              | Provide conceptual building elevations for all sides of the building(s), accessory structures such as but not exclusive of garages and trash enclosures. Note type of construction; label and note location and type of exterior finishes; depict and label windows and exterior doors; identify exterior lighting; depict and label rooftop mechanical units. Note building height as measured from existing grade to the midpoint of the roof. Grade shall be based on USGS elevations.                                                                                                                                                                                                                                                                    |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
|                                       |              | <p>For each elevation, provide a chart which describes the type of materials and percentage of total surface area in square feet. Example shown below:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th colspan="3">West Elevation</th> </tr> <tr> <th></th> <th>Surface Area</th> <th>Percentage of Net*</th> </tr> </thead> <tbody> <tr> <td>Gross of wall</td> <td>2,850 s.f.</td> <td>NA</td> </tr> <tr> <td>Net* EIFS</td> <td>1,500 s.f.</td> <td>53%</td> </tr> <tr> <td>Net* Concrete Masonry Unit</td> <td>1,065 s.f.</td> <td>37%</td> </tr> <tr> <td>Net* glazing</td> <td>285 s.f.</td> <td>10%</td> </tr> </tbody> </table> <p>*Net excludes roof forms, awnings and similar features. Includes glazed windows and doors.</p> | West Elevation |     |  |  | Surface Area | Percentage of Net* | Gross of wall | 2,850 s.f. | NA | Net* EIFS | 1,500 s.f. | 53% | Net* Concrete Masonry Unit | 1,065 s.f. | 37% | Net* glazing | 285 s.f. | 10% |  |  |
| West Elevation                        |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
|                                       | Surface Area | Percentage of Net*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
| Gross of wall                         | 2,850 s.f.   | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
| Net* EIFS                             | 1,500 s.f.   | 53%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
| Net* Concrete Masonry Unit            | 1,065 s.f.   | 37%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
| Net* glazing                          | 285 s.f.     | 10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
|                                       |              | If project will be completed in multiple phases, provide phasing plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |
|                                       |              | The following note shall be included on each sheet of the architectural elevations: "These elevations are conceptual in nature. Individual building elevations may vary but will be evaluated for compliance with design standards contained within Title 070 of the Glenwood Springs Municipal Code at the time of submitting a building permit application."                                                                                                                                                                                                                                                                                                                                                                                               |                |     |  |  |              |                    |               |            |    |           |            |     |                            |            |     |              |          |     |  |  |



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### **Complete Plan Set: Preliminary Landscaping Plan**

The Preliminary Landscaping Plan must include the information listed below to be considered complete. During the Pre-application Meeting, City Staff may request additional items.

| <b>Preliminary Landscaping Plan</b> |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |     |
|-------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Applicant                           |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | City Staff |     |
| Yes                                 | N/A |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes        | N/A |
|                                     |     | Depict existing and proposed topography, existing physical features including geological formations, watercourses and water bodies; existing streets, trails, sidewalks, parking areas, and other circulation areas; existing and proposed utility easements; electric transformers and mechanical units; existing and proposed buildings and structures; existing and proposed trash collection areas; existing and proposed light poles; and existing and proposed retaining walls and fencing noting top and bottom of wall/fence elevations. |            |     |
|                                     |     | Show and label all parking areas and parking spaces. Depict parking landscape areas. Note dimensions of landscape areas such as width of parking lot landscape islands, planting strips, landscaped setback areas.                                                                                                                                                                                                                                                                                                                               |            |     |
|                                     |     | Show and label limits of disturbance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |     |
|                                     |     | Identify all existing trees and shrubs intended for preservation. Provide caliper sizes for all existing trees to remain.                                                                                                                                                                                                                                                                                                                                                                                                                        |            |     |
|                                     |     | Provide locations for all proposed landscaping. Utilize different graphic symbols to represent the different general types of plantings: trees, shrubs, grasses, perennials.                                                                                                                                                                                                                                                                                                                                                                     |            |     |
|                                     |     | Depict and label sight triangles at all street and driveway/street intersections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |     |
|                                     |     | Include a chart identifying the total amount of landscape and hardscape areas expressed in square feet and as a percentage of the total lot area. For parking areas, note square footage of landscaped area and as a percentage of the parking area; include total number of required and provided trees, shrubs, and perennials.                                                                                                                                                                                                                |            |     |



## Construction Management Plan Checklist

Prior to the approval of a building/ROW/Grading permit, any commercial, multi-family, or applicable single family/duplex project must complete an approved Construction Management Plan (CMP). Below are the required items to be included in the CMP. Please check "yes" if the item is included, "no" if it is not, and "N/A" if not-applicable. Please provide an explanation for any "No" answers at the bottom of the checklist.

**Project Name:** P0024 Locker Room Renovation

**Date:** 1/21/2025

**Estimated Construction Start Date:** 4/1/2025

**End Date:** 5/15/2025

**Individual responsible for CMP monitoring and compliance Name:**

Ben Hofstra

**Phone # (local):** (720) 272-7299

|                                                                                                                                              | Yes                                 | No                                  | N/A                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <b>1. General</b>                                                                                                                            |                                     |                                     |                                     |
| a. CMP is shown on the proposed site plan                                                                                                    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| b. Schedule Pre-Construction Meeting ( <i>required only for commercial, industrial, &amp; multifamily projects</i> )                         | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| c. Right of Way permit (i.e. work or obstruction within ROW). <i>If required, describe below and include estimated start and stop dates.</i> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <b>2. Erosion and Sedimentation Control Plan showing</b>                                                                                     |                                     |                                     |                                     |
| a. Topographic Information – including sufficient detail to characterize the site                                                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| b. Areas and extent of soil disturbance (show any phasing)                                                                                   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c. Location of all on site and adjacent water bodies, wetlands, drainages, and storm water systems                                           | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| d. Vehicle tracking control measures (vehicle track pad, vehicle wash station, etc.)                                                         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| e. Inlet protection                                                                                                                          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| f. Perimeter Control Measures (BMPs)                                                                                                         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| g. Standard details for all proposed control measures                                                                                        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <b>3. Site Construction Facilities (Identify the following):</b>                                                                             |                                     |                                     |                                     |
| a. Staging areas                                                                                                                             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| b. Stockpile areas                                                                                                                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| c. Dumpsters and trash receptacles                                                                                                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| d. Sanitary facilities                                                                                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| e. Loading/Unloading areas                                                                                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| f. Trailers and field offices (show access)                                                                                                  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <b>4. Parking:</b>                                                                                                                           |                                     |                                     |                                     |
| a. Location and number of onsite and any offsite stabilized parking areas                                                                    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| b. Is project located downtown? <i>If so, describe below where contractor parking will occur</i>                                             | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |



|                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                          |                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                          |                          |
| <b>5. External Traffic Control Plan showing:</b>                                                                                                                                                                                                                                                                                                                                                                                    |                          |                          |                          |
| a. Show/label all traffic control devices (MUTCD compliant)                                                                                                                                                                                                                                                                                                                                                                         | <input type="checkbox"/> | <input type="checkbox"/> | ✓                        |
| b. Site access points; show existing adjacent streets and driveways; identify any changes and associated signage                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> | <input type="checkbox"/> | ✓                        |
| c. Sidewalks and trails; identify any changes and associated signage                                                                                                                                                                                                                                                                                                                                                                | <input type="checkbox"/> | <input type="checkbox"/> | ✓                        |
| d. Use of the public Right of Way (ROW) - generally not permitted (for constrained sites show any proposed use of ROW, and obtain a ROW Permit from the City)                                                                                                                                                                                                                                                                       | <input type="checkbox"/> | <input type="checkbox"/> | ✓                        |
| e. Crane use details, including but not limited to, ROW encroachment, swing radius, loading locations (Crane will require ROW permit from the City)                                                                                                                                                                                                                                                                                 | <input type="checkbox"/> | <input type="checkbox"/> | ✓                        |
| <b>6. Internal Access Control showing</b>                                                                                                                                                                                                                                                                                                                                                                                           |                          |                          |                          |
| a. Emergency access- <u>24' wide all weather surface for emergency access thru site</u> (to be maintained at all times)                                                                                                                                                                                                                                                                                                             | ✓                        | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>7. CSP Standard Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                       |                          |                          |                          |
| a. Standard CMP notes included on the site plan or Civil Plan Sheets                                                                                                                                                                                                                                                                                                                                                                | ✓                        | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>8. Dust Control</b>                                                                                                                                                                                                                                                                                                                                                                                                              |                          |                          |                          |
| <p>Provide narrative describing efforts to reduce fugitive dust from construction activities:<br/> Dust from demolition and construction activities to be isolated to the impacted area with dust control measures placed at openings and entryways. Low pressure zone created within impacted areas to prevent dust from escaping to public areas. Dust accumulation in impacted areas will be dealt with on an ongoing basis.</p> |                          |                          |                          |
| <p>Provide explanation for any "No" or "N/A" answers:</p> <p>1c. Public ROW unaffected<br/> 2b-g. No erosion or sediment anticipated by SOW<br/> 3f. No field trailer needed. GC Office is across the street from construction zone<br/> 5a-e. No external traffic control plan needed</p>                                                                                                                                          |                          |                          |                          |

**\*\* Plans shall be phased and updated as the project evolves and site conditions change.**

**\*\* Please notify adjacent property owners prior to mobilization.**

## Standard Notes for Construction Management Plans:

1. This plan shall be kept on site at all times and updated to reflect any changes.
2. Clearing or grading shall not begin until all control measures have been installed.
3. Contractor is responsible for installing and maintaining temporary erosion and sediment control measures during construction and establishing any required permanent control measures to prevent release of pollutants from the project site.
4. Control measures shall be used, modified, and maintained whenever necessary to reflect current conditions. Control measures shall be inspected weekly and after every precipitation event. Accumulated sediment shall be removed from control measures when the sediment level reaches  $\frac{1}{2}$  the height of the control measure.
5. The contractor shall promptly remove all sediment, mud, and construction debris that may accumulate in the right of way, private property, or water ways as a result of the construction activities.
6. All ingress and egress access points on to the disturbed site must be stabilized with a vehicle tracking control pad. Access shall only be via approved locations as shown on approved CSP.
7. Temporary soil stabilization measures shall be implemented where ground disturbances have temporarily or permanently ceased for 14 days or for areas of land disturbance within one growing season.
8. Concrete waste and washout water from mixing trucks shall be contained on site, removed from the site, and properly disposed. Materials shall not be allowed to enter state waters.
9. Contractor is responsible for complying with all local, state, and federal laws. In addition contractor must obtain required permits.
10. Emergency access must be kept obstacle free and passable at all times.
11. For any work to be done in the Right of Way, coordinate with the City ROW Manager regarding special permitting. No work shall be conducted in the ROW between November 1 and May 1 without prior approval from the director of Public Works.
12. Where required as part of the ROW permit or where site work affects the pedestrian or vehicle travel way, traffic control shall be installed. All traffic control shall be in accordance with the Manual on Uniform Traffic Control Devices, latest edition.
13. Sidewalks adjacent to construction sites shall be maintained, for public use, by the contractor. In areas where construction is taking place next to the sidewalk and overhead hazards are possible, site is responsible for installing and maintaining sidewalk protection.



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** January 16, 2025 Council Minutes

**Action Requested:** January 16, 2025 City Council Minutes

**Department:** City Clerk

**Presented By:**

**Strategic Goals:**

**Background Info:**

**Issues:**

**Fiscal Impact:**

**Legal Review:**

**Staff Recommendation:**



MINUTES  
CITY OF GLENWOOD SPRINGS  
CITY COUNCIL MEETING  
JANUARY 16, 2025  
6:15 PM

Note: Official meeting minutes are located on the City website via YouTube video at the following link: <https://www.youtube.com/user/GlenwoodSprings1885/videos>. The times in agenda items indicate approximately where the item can be found on the YouTube video timeline.

## REGULAR SESSION

### Item 5. 5:24 Roll Call

**Present:** Councilor Simms, Councilor Schachter, Councilor Weimer, Mayor Wussow, Councilor Zalinski, Councilor Godes, and Mayor Pro Tem Dehm.

**Staff Present:** Also present were City Manager Steve Boyd; City Clerk Ryan Muse; City Attorney Karl Hanlon; Finance Director Yvette Gustad; Director of Economic and Community Development Hannah Klausman; and City Engineer Ryan Gordon.

### Item 6. 5:41 Agenda Changes & Conflicts

*Mayor Pro Tem Dehm wished to pull the January 27, 2025 minutes off of the consent agenda to be voted on separately as he was not here and cannot vote yay or nay.*

*Councilor Godes would like to pull Item E, City Manager Employment Contract, off of the consent agenda and discuss it separately.*

### Item 7. 6:41 Council Announcements

Councilor Zalinski made comments welcoming new board and commission members and Councilor Simms requested that Council discuss the Spring Cleanup program.

### Item 8. 8:29 Citizens Appearing Before Council (for items not on the agenda - comments limited to 3 minutes)

Rachel Wynn, resident, came to discuss the issue of wildfires. Mayor Wussow replied to her concerns.

Mike Harmon, resident, made comments regarding street improvement taxes and legislative actions.

Laurie Chase, resident, also made comments regarding fire risks and the issue of private property owner's responsibilities.

### Item 9. 17:57 Council Response to Citizen Comments

Councilors Godes, Schachter, Zalinski and Mayor Wussow responded to comments made by the public.

### Item 10. 25:04 Consent Agenda

*Mayor Wussow moved to approve the consent agenda minus items A and E. Councilor Weimer seconded and the motion passed unanimously.*

## Item 11. 25:33 January 2, 2025, Council Minutes

***Councilor Godes moved to approve the City Council minutes from the January 2, 2025 meeting.***

***Councilor Zalinski seconded the motion and it passed 6-0. Mayor Pro Tem Dehm did not vote.***

## Item 12. 25:58 City Manager Employment Contract

Councilors Schachter and Godes discussed why this item was pulled from the consent agenda.

***Councilor Godes moved to amend the current contract by \$2000 a month to observe the housing allowance that the previous City Manager received. Mayor Pro Tem Dehm seconded the motion.***

***The motion passed unanimously with Councilor Schachter abstaining.***

## Item 13. 33:10 Glenwood Springs Historical Society Budget

Jamie LaRue, Board President, and Tyler Benson, Board Vice President, provided a financial update to the City Council

***Councilor Godes moved approve \$60,000 in support plus up to an additional \$20,000 match for anything over the \$27,000 raised in contributions in 2024.***

***Councilor Schachter seconded the motion.***

***Councilor Godes withdrew the motion after discussion.***

***Mayor Pro Tem Dehm moved to approve \$80,000 in funding from here on out as a baseline, and up to \$40,000 matching funds match coming from tourism. Councilor Zalinski seconded the motion, and it passed unanimously.***

## Items 14. 1:06:25 Community Center Event regarding Local Government Participation

City Manager Steve Boyd presented the topic. Mayor Wussow and Council members discussed the idea behind an event which would be similar to a job fair to gain interest in the city commissions and boards.

## Item 15. 1:16:21 Ordinance 2025-02; Changing the Name of the Street Tax Fund

Karl Hanlon presented the item.

Mayor Wussow opened the floor up to public comment.

There was none.

Mayor Wussow closed the floor up to public comment.

***Mayor Pro Tem Dehn moved to approve Ordinance 2025-02; Changing the Name of the Street Tax Fund as presented. Councilor Zalinski seconded the motion and it passed unanimously.***

## Item 16 1:18:12 Ordinance 2025-03 Budget Amendment #1 for 2025. (ONE READING)

City Manager Steve Boyd presented the topic.

Mayor Wussow opened the floor up to public comment.

There was none.

Mayor Wussow closed the floor up to public comment.

***Councilor Zalinski moved to approve Ordinance 2025-03 Budget Amendment #1 for 2025 as presented. Mayor Pro Tem Dehm seconded the motion, and it passed unanimously.***

## Item 17. 1:44:33 Planning File 34-24 Preliminary Plat and Planning File 36-24 Residential Minor Site and Architectural Plan

Emery Ellingson, Senior Planner, presented. City Engineer Ryan Gordon and Public Works Director Matt Langhorst answered some questions posed by the Council.

The applicants, Roger Giard and Ben West presented and answered questions posed by Council. Public Community Development Director Hannah Klausman also addressed the Council and answered questions regarding the project.

Mayor Wussow opened the floor up to public comment.

Laurie Chase, resident of the area this proposed project is in, made public comment.

Mayor Wussow closed the floor up to public comment.

***Councilor Schachter moved to approve Planning File 34-24 Preliminary Plat as presented. Mayor Pro Tem Dehm seconded the motion, and it passed unanimously.***

***Mayor Pro Tem Dehm moved to approve Planning file 36-24 Residential Minor Site and Architectural Plan as presented. Councilor Zalinski seconded the motion, and it passed unanimously.***

## Item 18. 2:38:17 Sale Tax Rebate Request from the Meadows

City Attorney Karl Hanlon presented a proposed sales tax incentive agreement between the City and WMG Meadows, LLC (Miller Realty) regarding the vacant Bed Bath & Beyond space at Glenwood Meadows.

Mayor Wussow opened the floor up to public comment.

There was none.

Mayor Wussow closed the floor up to public comment.

***Mayor Pro Tem Dehm moved to discuss the topic at a work session on February 6, 2025 and Council requests a representative and the applicant appear before Council at the meeting that day. Councilor Schachter seconded the motion, and it passed unanimously.***

## Item 19. 3:05:10 Council Comments

Councilor Schachter made comments about parking and city code.

Councilor Simms said he would like to have a work session or meeting to deepen the Council's toolbox for understanding these issues.

Chief Hassell addressed questions from Councilor Weimer regarding ongoing projects regarding parking violation technologies and traffic cameras that have recently been implemented.

Councilor Godes made comments regarding the flow and consistency of the Council meeting proceedings. Mayor Wussow responded.

Mayor Wussow complimented the Community Development Director and her department for their work and presentations. She also commented on the South Bridge update that took place at the work session earlier today and complimented the Engineering and Public Works department for their work on these updates.

## **Item 20. 3:11:48 Report from City Administration**

City Manager Steve Boyd announced their will be a Community Listens event that takes place April 6-8 in Council Chambers. The Financial Advisory Board will be meeting soon and if Council has anything they'd like to address, please let administration know. He also gave an update on IT staffing.

City Attorney Karl Hanlon addressed items that will soon be litigated regarding a local mine issue. He gave an update on the West Glenwood Sanitation District.

Mayor Wussow read the correspondence in the file.

***Councilor Godes moved to provide a letter of support for the CDOT RAISE Grant application. Mayor Pro Tem Dehm seconded the motion, and it passed unanimously.***

## **Item 21. 3:19:30 Social Event Announcement**

Mayor Pro Tem Dehm announced that the social event would take place at Doc Holliday's following the meeting.

## **Item 22. 3:21:07 Adjournment**

***Mayor Pro Tem Dehm moved to adjourn. Councilor Simms seconded the motion, and it passed unanimously.***



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Planning and Zoning Commission Reappointments

**Action Requested:** Reappoint Commission Chair and regular Member to additional term.

**Department:** City Clerk

**Presented By:** Ryan Muse

**Strategic Goals:** Preserve and Improve Infrastructure

**Background Info:** Commission Chair Peter Waller and Commissioner Amy Connerton's first terms are expiring at the end of February 2025. Both have applied for reappointment and staff liaison to the commission, and Community Development Director, Hannah Klausman, recommends that they both be reappointed for their second and final term to expire in 2028.

**Issues:** N/A

**Fiscal Impact:** N/A

**Legal Review:** N/A

**Staff Recommendation:** Staff defers to Council.



Planning and Zoning Commission Application - Submission #2958

Date Submitted: 1/9/2025

Planning and Zoning Commission Application

City of Glenwood Springs  
101 W. 8th St.  
Glenwood Springs, CO 81601

Hannah Klausman; Director, Economic and Community Development  
hannah.klausman@cogs.us  
970-384-6407



Thank you for your interest in serving your community. Please answer all questions on this application.

*Please note that appointments can be for a regular seat or an alternate seat.*

Membership Qualifications\*

Yes

Are you a resident of Glenwood Springs within city limits? You must be a resident within city limits to qualify.

Please select today's date\*

1/9/2025

Personal Information

First Name\*

Amy

Last Name\*

Connerton

Occupation\*

Education

Home Address\*

|                                                         |                          |                           |
|---------------------------------------------------------|--------------------------|---------------------------|
| <b>City*</b><br>Glenwood Springs                        | <b>State*</b><br>CO      | <b>Zip Code*</b><br>81601 |
| <b>Mobile Phone Number*</b>                             | <b>Email Address*</b>    |                           |
|                                                         |                          |                           |
| <b>Home Phone Number</b>                                | <b>Work Phone Number</b> |                           |
|                                                         |                          |                           |
| <b>Mailing Address (If different than home address)</b> |                          |                           |
|                                                         |                          |                           |
| <b>City</b>                                             | <b>State</b>             | <b>Zip Code</b>           |
|                                                         |                          |                           |

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### Personal and Professional Interests

#### Why are you interested in serving on the Planning and Zoning Commission?\*

I am deeply invested in the responsible growth and development of Glenwood Springs. Since joining the Planning and Zoning Commission in 2021, I have developed a strong understanding of the community's needs and priorities. I am passionate about ensuring sustainable development that respects the character of our town while accommodating future needs. Continuing to serve on the commission allows me to contribute my expertise and collaborative approach to making thoughtful decisions that benefit residents and enhance the quality of life in our community.

#### What do you view as the role of a Planning and Zoning Commission member?\*

The role of a Planning and Zoning Commission member is to guide and oversee the development and use of land in a manner that aligns with the community's long-term vision, goals, and policies. This includes reviewing and making recommendations on zoning amendments, development proposals, and comprehensive plans while balancing growth, environmental sustainability, and the needs of residents and businesses. A commission member must ensure that decisions are informed by public input, adhere to regulations, and reflect a commitment to preserving the character and integrity of the community.

**What experience have you had in the land use approval process?\***

As a member of the Glenwood Springs Planning and Zoning Commission since 2020, I have gained extensive experience in the land use approval process. I have reviewed and evaluated numerous applications, including rezoning requests, variances, conditional use permits, and site development plans. This role has required me to analyze proposals for compliance with local zoning codes and alignment with the city's comprehensive plan, while also considering public input and environmental impact. My experience includes collaborating with city staff, developers, and community members to ensure balanced and thoughtful decisions that serve the best interests of Glenwood Springs

**Do you have any particular areas of interest or a particular perspective relating to land use development in Glenwood Springs?\***

I am particularly interested in promoting sustainable and balanced development that preserves the natural beauty and character of Glenwood Springs while accommodating future growth. I am passionate about fostering affordable housing opportunities to ensure that people who work in our community can also live here. Additionally, I am committed to supporting mixed-use developments that enhance walkability and connectivity while reducing environmental impact. My perspective is rooted in the belief that land use decisions should reflect the needs of current residents, while also planning thoughtfully for future generations

**Are you aware of and understand the quasi-judicial function of the Planning and Zoning Commission?\***

Yes, I am fully aware of and understand the quasi-judicial function of the Planning and Zoning Commission. As a quasi-judicial body, the commission must evaluate land use applications based on established laws, regulations, and evidence presented during public hearings. This role requires impartiality, a focus on facts, and a commitment to avoiding bias or influence from external factors. My experience on the commission since 2021 has reinforced the importance of this responsibility in ensuring that decisions are fair, transparent, and legally sound

**Can you describe an experience making a decision that made people unhappy?\***

While I can't recall a specific instance of making a decision that caused significant unhappiness, I understand that serving on the Planning and Zoning Commission often involves balancing competing interests. It's inevitable that not all decisions will please everyone, but I approach every situation with an open mind, thorough analysis, and a focus on what is best for the community as a whole. I am prepared to navigate challenging decisions with transparency and fairness, even when they may not align with all perspectives

**Can you separate yourself from your personal opinions and represent the City's goals, policies, plans and the Glenwood Springs Municipal Code in an equitable fashion?\***

Yes, I am fully capable of separating my personal opinions from my responsibilities as a Planning and Zoning Commission member. My primary focus is on representing the City's goals, policies, plans, and the Glenwood Springs Municipal Code in a fair and equitable manner. Serving on the commission since 2020 has reinforced the importance of adhering to established regulations and ensuring that all decisions are made objectively, based on facts and evidence. I am committed to maintaining impartiality and upholding the integrity of the process to serve the best interests of the entire community

**The Planning and Zoning Commission members generally attend one to two meetings a month and can have extensive packet materials to review in preparation for meetings. Do you have any existing time commitments that will hamper your ability to serve?\***

None

**What experience do you have working with people on a board, commission, or committee?\***

Serving in different committees in higher education for 15 years and Planning and Zoning for the last 4 years

**Have you previously served on the Planning and Zoning Commission?\***

Yes

## Reappointment Applicants

These questions only required for reappointment applicants.

### Why do you think you should be reappointed?

I am deeply invested in the responsible growth and development of Glenwood Springs. Since joining the Planning and Zoning Commission in 2021, I have developed a strong understanding of the community's needs and priorities. I am passionate about ensuring sustainable development that respects the character of our town while accommodating future needs. Continuing to serve on the commission allows me to contribute my expertise and collaborative approach to making thoughtful decisions that benefit residents and enhance the quality of life in our community.

### Have you served two full successive terms on the Planning and Zoning Commission?

No

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## Powers and Duties of the Planning and Zoning Commission

*(as defined in Title 020 of the Glenwood Springs Municipal Code); f. Powers and Duties of the Planning and Zoning Commission*

The powers and duties of the Planning and Zoning Commission shall be:

1. To develop and recommend a master plan subject to the approval of the City Council and its environ in accordance with the provisions of this Code and the laws of the State.
2. To recommend to the City Council boundaries of zone districts and regulations to be enforced therein, in accordance with the provisions of this Code and the laws of the State.
3. To review proposals relating to subdivision, development and use of land and make decisions or recommendations on such proposals, in accordance with the procedures and provisions set forth in this Code.
4. To hear and decide appeals wherein there is a question of interpretation of the zone district map, the master plan or related documents and similar questions as they may arise in the administration of this Code.
5. The Planning and Zoning Commission shall have the duty and power to act on appeals with regard to matters arising from enforcement of provisions of Title 070 of this Code, including:
  - Review of administrative decisions. To hear and decide appeals where it is alleged there is error in any action, including any order, interpretation, requirement, decision or determination made by an administrative official of the city in the enforcement of Title 070 of this Code.
  - Variances. To hear and decide requests for variances from the zoning provisions and sign regulation provisions where there are unique, unnecessary and unreasonable hardships in the way of carrying out the strict letter of said provisions; and to hear and decide requests for variances to allow deviations from restrictions upon the construction and placement of buildings and other structures on site. Examples of such variances include, but are not limited to, modifications of minimum area requirements, building coverage and setback restrictions. Variances from permitted and special review uses in zone district text shall not be considered.
6. To perform such other functions as required by the provisions of Title 070.
7. To service as the Building Board of Appeals.

*(as defined in Title 020 of the Glenwood Springs Municipal Code); c. Powers and Duties of Building Board of Appeals.*

The powers and duties of the Building Board of Appeals shall be:

1. To hear appeals in accordance with the International Building Code, International Residential Code, International Fire Code, and the other adopted codes from the International Code Council, as adopted or amended by Title 060 of this Code. Such power shall not include matters of interpretation arising under the Code.
-

## **Appointment, Removal, Term, and Vacancies of Boards and Commissions**

*(Per the Glenwood Springs, CO Municipal Code 020.020.040)*

(a) Appointment and term of members. Except as otherwise provided, all appointments to the boards and commissions shall be by the City Council for terms of three (3) years each, and each member shall serve until his/her successor is appointed and takes office; provided, however, that the initial terms of office may be shortened by the City Council so as to provide overlapping terms of office. Appointments shall expire the day before the first regular meeting of the City Council in each month according to the following schedule:

1. February:

Planning and Zoning Commission;  
Finance Advisory Board;  
Tourism Management Board;  
Building Board of Appeals.

2. March:

Transportation Commission;  
Arts and Culture Board;  
Parks and Recreation Commission;  
Airport Board;  
River Commission.

3. April:

Local Liquor Licensing Authority;  
Victim's Witnesses Assistance and Law Enforcement Board;  
Historic Preservation Commission;  
Workforce Housing Fund Advisory Board;  
Glenwood Springs Housing Commission.

(b) Alternate members. The City Council at its discretion may appoint up to three (3) persons as alternate members for each board or commission. If a regular member of a board or commission is to be absent from a meeting, the presiding officer for the meeting may select an alternate member to fill such absence and to attend and serve at the meeting. The alternate member may exercise all powers at the meeting which the absent regular member could exercise, and the alternate's powers and privileges shall terminate at the end of the meeting attended. The presiding officer may at his/her discretion select the same alternate to serve at successive meetings in the absence of any member.

(c) Limit to term of members. Unless it is deemed vital by the City Council that an appointed member of a board or commission be retained in office, no Board member shall serve more than two (2) full successive terms on the same board or commission. An individual may serve multiple non-successive terms on the same board or commission.

(d) Removal of members. All appointed members of a board or commission shall be subject to removal, at any time, by the City Council. In the event an appointed member of a board or commission ceases to qualify for membership, his or her appointment is immediately terminated.

(e) Vacancies. The City Council shall fill all vacancies on boards and commissions by appointment for the unexpired term.

(Code 1971 §§ 2-63, 2-64, 2-67; 6-95 § 1; 10-07 § 2; Ord. No. 9-2018 , § 2, 4-20-2018)

Planning and Zoning Commission Application - Submission #2960

Date Submitted: 1/9/2025

Planning and Zoning Commission Application

City of Glenwood Springs  
101 W. 8th St.  
Glenwood Springs, CO 81601

Hannah Klausman; Director, Economic and Community Development  
hannah.klausman@cogs.us  
970-384-6407



Thank you for your interest in serving your community. Please answer all questions on this application.

*Please note that appointments can be for a regular seat or an alternate seat.*

Membership Qualifications\*

Yes

Are you a resident of Glenwood Springs within city limits? You must be a resident within city limits to qualify.

Please select today's date\*

1/9/2025

Personal Information

First Name\*

peter

Last Name\*

waller

Occupation\*

retired

Home Address\*



|                  |               |                  |
|------------------|---------------|------------------|
| <b>City*</b>     | <b>State*</b> | <b>Zip Code*</b> |
| Glenwood Springs | CO            | 81601            |

|                             |                       |
|-----------------------------|-----------------------|
| <b>Mobile Phone Number*</b> | <b>Email Address*</b> |
|                             |                       |

|                          |                          |
|--------------------------|--------------------------|
| <b>Home Phone Number</b> | <b>Work Phone Number</b> |
|                          |                          |

**Mailing Address (If different than home address)**

|             |              |                 |
|-------------|--------------|-----------------|
| <b>City</b> | <b>State</b> | <b>Zip Code</b> |
|             |              |                 |

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**Personal and Professional Interests**

**Why are you interested in serving on the Planning and Zoning Commission?\***

I enjoy participating in the land-use process for our city. I feel it's very important for the citizens to be heard, and to understand the process and reasoning behind why or why not a project is approved. I feel like my experience helps make a difference. I've lived in the community for 25 years, and love Glenwood.

**What do you view as the role of a Planning and Zoning Commission member?\***

I have served as the commission chairman for the last year. I like the team environment/problem solving of the commission, and getting all commissioners to participate to hear different perspectives for a richer solution

**What experience have you had in the land use approval process?\***

I was a developer and contractor in Glenwood Springs for approximately 20 years. I built single family homes, small multi-family developments, and several office buildings.

**Do you have any particular areas of interest or a particular perspective relating to land use development in Glenwood Springs?\***

housing projects including affordable housing, code revision/development,

**Are you aware of and understand the quasi-judicial function of the Planning and Zoning Commission?\***

yes

**Can you describe an experience making a decision that made people unhappy?\***

a recent development that was approved by P&Z on Cowden. The project followed the code and only had one minor variance. Neighborhood members did not want to see a project that size being built in that location. Even though the project was approved, I feel the citizens were heard by the commission and understood why it was approved....though still not happy with the outcome.

**Can you separate yourself from your personal opinions and represent the City's goals, policies, plans and the Glenwood Springs Municipal Code in an equitable fashion?\***

yes

**The Planning and Zoning Commission members generally attend one to two meetings a month and can have extensive packet materials to review in preparation for meetings. Do you have any existing time commitments that will hamper your ability to serve?\***

no

**What experience do you have working with people on a board, commission, or committee?\***

have served on the planning commission for the past 3 years. have served on community boards: Junior achievement president, GWS soccer board president, Sunlight ski team treasurer, Presbyterian church board member

**Have you previously served on the Planning and Zoning Commission?\***

Yes



---

### Reappointment Applicants

These questions only required for reappointment applicants.

**Why do you think you should be reappointed?**

I feel like my developer/contractor experience helps to enrich the process. I also feel like I'm a good team member with the overall commission

**Have you served two full successive terms on the Planning and Zoning Commission?**

No





## **Powers and Duties of the Planning and Zoning Commission**

*(as defined in Title 020 of the Glenwood Springs Municipal Code); f. Powers and Duties of the Planning and Zoning Commission*

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  - Variances. To hear and decide requests for variances from the zoning provisions and sign regulation provisions where there are unique, unnecessary and unreasonable hardships in the way of carrying out the strict letter of said provisions; and to hear and decide requests for variances to allow deviations from restrictions upon the construction and placement of buildings and other structures on site. Examples of such variances include, but are not limited to, modifications of minimum area requirements, building coverage and setback restrictions. Variances from permitted and special review uses in zone district text shall not be considered.
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*(as defined in Title 020 of the Glenwood Springs Municipal Code); c. Powers and Duties of Building Board of Appeals.*

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-

## **Appointment, Removal, Term, and Vacancies of Boards and Commissions**

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Finance Advisory Board;  
Tourism Management Board;  
Building Board of Appeals.

2. March:

Transportation Commission;  
Arts and Culture Board;  
Parks and Recreation Commission;  
Airport Board;  
River Commission.

3. April:

Local Liquor Licensing Authority;  
Victim's Witnesses Assistance and Law Enforcement Board;  
Historic Preservation Commission;  
Workforce Housing Fund Advisory Board;  
Glenwood Springs Housing Commission.

(b) Alternate members. The City Council at its discretion may appoint up to three (3) persons as alternate members for each board or commission. If a regular member of a board or commission is to be absent from a meeting, the presiding officer for the meeting may select an alternate member to fill such absence and to attend and serve at the meeting. The alternate member may exercise all powers at the meeting which the absent regular member could exercise, and the alternate's powers and privileges shall terminate at the end of the meeting attended. The presiding officer may at his/her discretion select the same alternate to serve at successive meetings in the absence of any member.

(c) Limit to term of members. Unless it is deemed vital by the City Council that an appointed member of a board or commission be retained in office, no Board member shall serve more than two (2) full successive terms on the same board or commission. An individual may serve multiple non-successive terms on the same board or commission.

(d) Removal of members. All appointed members of a board or commission shall be subject to removal, at any time, by the City Council. In the event an appointed member of a board or commission ceases to qualify for membership, his or her appointment is immediately terminated.

(e) Vacancies. The City Council shall fill all vacancies on boards and commissions by appointment for the unexpired term.

(Code 1971 §§ 2-63, 2-64, 2-67; 6-95 § 1; 10-07 § 2; Ord. No. 9-2018 , § 2, 4-20-2018)



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Award Request for Proposal 2024-26P Fire Station Bay Exhaust Removal System                                                                                                                                                                                                                                                                                                                          |
| <b>Action Requested:</b>     | Award Request for proposal 2024-26P Fire Dept exhaust extractor to Weidner Fire of Midvale, UT                                                                                                                                                                                                                                                                                                       |
| <b>Department:</b>           | Fire Department                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Presented By:</b>         | Joseph Deras                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Strategic Goals:</b>      | Provide Efficient and Responsive City Government<br>Preserve and Improve Infrastructure                                                                                                                                                                                                                                                                                                              |
| <b>Background Info:</b>      | The Glenwood Springs Fire Dept does not have any exhaust removal systems in its facilities. These systems remove harmful particulates from buildings and reduce health risks and exposures to its personnel. The department solicited bids and received two. This vendor was selected as it meets the specifications required and is used by area fire departments; demonstrating its effectiveness. |
| <b>Issues:</b>               | The department has identified this shortcoming in its efforts to provide a safe workplace. Acquiring the decades old technology will move to satisfy an industry standard in fire department facilities.                                                                                                                                                                                             |
| <b>Fiscal Impact:</b>        | Fees of \$47,864.29                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Legal Review:</b>         | NA                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Staff Recommendation:</b> | Staff is recommending the Council award the Request for Proposal 2024-26P – Exhaust extraction device to Weidner Fire.                                                                                                                                                                                                                                                                               |



Date of Proposal: January 6th, 2024

**For:**

The City of Glenwood Springs

**By:**

Weidner

135 West 7065 South

Midvale, UT 84047

**Contact info:**

CURTIS DRAGE

Cell # (801) 792-6505

Email CURTIS.DRAGE@WEIDNERPRO.COM



## **Table of Contents**

1. Cover Letter
2. Bid Schedule
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4. Project Timeline
5. Resources From Staff
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8. Start Date
9. Exceptions/if applicable



1.

The City of Glenwood Springs

806 Cooper Ave,

Glenwood Springs, CO 81601

Thank you for the opportunity to bid on the Fire Station Source Capture Exhaust system. Weidner is excited to be considered for the exhaust removal system project. Weidner is proud to offer MagneGrip PRO source capture vehicle exhaust removal systems to The City of Glenwood Springs.

Weidner is based in Midvale, Utah and has been a MagneGrip dealer for the western United States for over 18 years. We have been selling, installing, and servicing exhaust removal systems all over the West. We have over 35 employees and are growing.

MagneGrip is headquartered in Cincinnati, Ohio and is the only exhaust removal system manufactured entirely in the USA. MagneGrip is a certified Woman Owned Small Business (WOSB) and is a Women's Business Enterprise (WBE).

Weidner is proud to include the MagneGrip Pro Sliding Track (SFTMPRO) for station N0.2 . These systems use the least amount of hose, allowing ease of movement in tight spaces. The lower section of solid blue hose is rated at 850° Fahrenheit, this helps extend the life of the entire system. When the apparatus is started, the exhaust pressure starts the system fan and draws the exhaust emissions in the track and ductwork. As the apparatus exits the fire station the trolley and or balancer moves along the track and the magnetic nozzle automatically disconnects at the doorway.

Weidner is willing to dedicate the time and resources necessary to complete the project in a timely manner. Our team consists of the Exhaust Systems Manager, inside sales/project support, shipping department, installation team and design team. As of today, delivery of equipment is eight weeks from the time of order. Completion of the project will take approximately 5 working days.

Curtis Drage will be the project manager and is available for planning and onsite support during the project. Mike Thomas is the installation team manager; he will be leading the installation and available during the planning phase.

Sincerely, Curtis Drage



## **2.i      Products**

STFMPRO-361

MagneGrip 36 ft. pro sliding flex hose system, includes (6) sections of track, support legs, feet kits, slinky hose, 5" blue/white hose, 5" hi temp pro solid blue lower hose, knob handle, balancer, lifting elbow, pressure sensor, standard transmitter, 6" blast gate, and pro tailpipe adapter.  
520042-05

CF363-3

MagneGrip Cincinnati fan/motor assembly, 3 HP, Three phase, 3300 CFM at 6" sp, 10" inlet and outlet. Made in the USA.

500177-08

MagneGrip control panel for 3 HP three phase fan, wireless capabilities, stop button, UL certified, NEMA 4 enclosure, variable timer, compatible with the above motor and fan.

500157-10

MagneGrip 10" upblast and rain damper, specifically designed for exhaust removal systems, galvanized

500151-10

MagneGrip 10" exhaust silencer, specifically designed for exhaust removal systems, galvanized

Misc.

MagneGrip misc. tailpipe reducers and exhaust clamps.

**ALL MAGNEGRIP PARTS AND SYSTEM'S ARE MADE IN THE USA**

## **2.ii      Material**

Will include Spiral pipe and Magnegrip product.



## 2. iii. Labor

Weidner has been installing exhaust removal systems for over 18 years and we have encountered many challenging and technically difficult installations. After completing the site survey on Wednesday December 10th, I did not encounter any major issues regarding the installation of the exhaust removal systems.

Weidner does not use subcontractors to install the MagneGrip equipment. Our installation technicians have been trained and certified by the factory. We do subcontract the electrical work to local certified electricians.

Apparatus bays are cleaned and straightened prior to leaving for the evening.

*MagneGrip Project Flow and understanding of this project.*

- MagneGrip equipment arrives the week prior to the start of projects.
- Installation schedule as follows:
  - Station #2
- Rental scissor lift arrives.
- Some or all apparatus will need to be moved out of bay during day to perform work.
- Installation of fan.
- Electrician wires fan and control panel.
- Fan and control panel tested for proper operation.
- Legs and feet are assembled and installed. Lasers are used to ensure alignment is correct.
- Reinforcement supports installed on legs.
- track is installed on legs and feet.
- Hoses cut, assembled, and installed.
- Duct installed, starting with trunkline then tied into track.
- The system runs for three minutes.
- Tailpipe fittings and adapters are installed on fire apparatus.
- Hoses are attached to vehicles and tested.
- Duty crew and officers are trained in the operation of the system.
- Inspections are conducted by city officials.





**3.**

Add alternates

None needed



4.

#### **Proposed Timeline**

Glenwood Springs, timeline is to start and complete project and soon as possible Curtis Drage will oversee deliveries to the designated shipping location.

#### **On-Site Preparation and Uninstallation**

Mike Thomas and the team are scheduled to commence work on the Monday after equipment, starting with the removal of the old system fan and ducting at the first location.

Rental scissor lift will be on-site upon team arrival to facilitate project initiation.

#### **Installation Process**

Mike will set up the fan and control panel in preparation for the electrician.

Initial tasks include unboxing the MagneGrip System, aligning legs and feet with lasers for precision, and reinforcing supports.

Collaboration with on-site chiefs or captains will ensure efficient vehicle movement aligned with station operations.

#### **Track System Installation**

Construction will proceed with building and hanging the track system.

#### **Duct Work and Final Integration**

Mike Thomas will initiate duct work, starting from the truckline and integrating it with the track system.

Final tasks of the system installation involve installing tailpipe fittings and adapters on fire apparatuses, followed by hose attachment and testing on vehicles.

#### **System Testing, Training, and Inspection**

Upon completing installation and testing, the duty crew and officers will undergo comprehensive training on system operations.

City officials will conduct inspections to ensure compliance and operational readiness.



5.

### **Resources from staff**

#### **Project Team**

**Curtis Drage**- Is the exhaust removal manager on the The City of Glenwood Springs Project.

He will oversee the start and finish of the project working with install team, electrician, equipment rentals, waste removal. Curtis will handle all communication with factory, city officials, Fire chief and staff. Curtis has over 13 years of customer care, sales, and management experience.

Email: [Curtis.Drage@weidnerpro.com](mailto:Curtis.Drage@weidnerpro.com)

Phone: (801) 792-6505



**John Rech** – John is the exhaust systems manager at Weidner. He has been in safety sales for over 22 years with 17 years of sales experience in the fire service. He oversees all exhaust projects. He works one on one with fire departments, contactors, architects, and mechanical engineers.

Email: [john.rech@weidnerpro.com](mailto:john.rech@weidnerpro.com)

Phone: 385-226-09720972



**Erik Barlow** – Erik is the lead customer care person for Weidner. He has worked for Weidner for two years and assists with orders, order tracking, and project coordination. Erik teams with Mike Thomas to ensure the installation team has all the necessary equipment and supplies to execute the project in the most efficient way.

Email: [Erik.Barlow@weidnerpro.com](mailto:Erik.Barlow@weidnerpro.com)





Phone: 801-727-9298

**Mike Thomas** - Mike is the head of the installation team. He has worked for Weidner for 17 years and has over 20 years' experience installing Magen Grip systems. He has sold, installed, and serviced hundreds of systems all over the western US. He has been trained and certified by MagneGrip and conducts many factory installations that are outside of the Weidner territory. Mike is the go-to person when there are questions on unusual installations. He is very personable and is an excellent trainer in the operation of the systems.

Phone: 385-229-9464



**Dehn St. John** – Dehn is the service manager for Weidner. He has worked for Weidner for 10 years. He is a certified technician for MSA, Bauer compressors, Holmatro Rescue Tools and MagneGrip. He travels the western US for Weidner service. Dehn is a captain at Park City Fire Department where he has worked for 20 years.

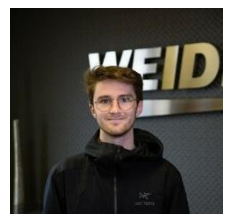
Email: [dehnstjohn@weidnerpro.com](mailto:dehnstjohn@weidnerpro.com)

Phone: 801-541-5988



**Parker Colligan** – Parker is the logistics manager at Weidner. Parker has worked for Weidner for two years and he is responsible for all items that travel through the Salt Lake City Warehouse. Parker is the grandson of the founder.

Email: [parker.colligan@weidnerpro.com](mailto:parker.colligan@weidnerpro.com)



**Weidner Fire** | 135 West 7065 South | Midvale, Utah | 801.565.9595 | [weidnerfire.com](http://weidnerfire.com)



6.

### **MagneGrip Exhaust System Three - Year Warranty**

Weidner Fire, MagneGrip's factory authorized distributor and installation representative for the Western United States, hereby warrants the MagneGrip exhaust extraction system for a period of three years from date of installation completion, with a period of three years on labor.

All major components of the MagneGrip system are covered for a full **three years**:

- Fan
- Motor
- Controllor
- Track
- Legs
- Supports
- Aluminum Transition Elbow
- Lifting Elbow
- Duct System
- Labor to Repair or Replace Defective Parts
- Rubber Boot
- Magnepaks
- Magnets
- Transmitters (batteries excluded)
- Hoses
- Balancers
- Sensors

Weidner Fire and MagneGrip reserve the right to replace **or** repair the defective or damaged part. This warranty does not cover parts that fail due to misuse, abuse, or lack of maintenance. Regular adjustments/maintenance are not included in this warranty but will be thoroughly explained and demonstrated to the customer in our extensive training session at the time of installation. Weidner Fire will cover parts and labor for three years. Weidner will provide warranty assistance within twenty-four (24) hours.

**Weidner Fire**

135 West 7065 South

Midvale, UT 84047

**Weidner Fire** | 135 West 7065 South | Midvale, Utah | 801.565.9595 | [weidnerfire.com](http://weidnerfire.com)



7.

### **Qualifications and References**

Weidner has installed many exhaust removal systems in fire departments like Glenwood Springs. Weidner's fire division has been working with fire departments for 20 years. We have worked with hundreds of departments on their AFG grant awards and understand the process of grant applications, awards, and reimbursement. Below is a list of departments with information required in the bid.

1. Meridian Fire Department – Weidner has designed and installed MagneGrip systems eight stations with straight suction rail. Financed through budget money and new construction projects. These projects started in 2019 and completed station #8 in Sept. 2023. Total amount of projects \$ 520,000. The Weidner service team performs annual maintenance on all systems in each station.  
33 E Broadway  
Meridian, ID 83642  
Stacy Redman  
sredman@meridiancity.org  
208-489-0374
2. SAC Metro Fire – Weidner has installed and designed 11 stations with MagneGrip rail and track. The department has a total of 41 stations and Weidner supplied parts for maintaining all stations. Financed through budget money, projects started in 2017 and are ongoing.  
10545 Armstrong Ave Suite 200  
Mather, CA  
Joe Eachus [Eachus.clarence@metrofire.ca.org](mailto:Eachus.clarence@metrofire.ca.org)



3. Sky Valley Fire – Weidner has designed and installed MagneGrip systems in 4 stations with VSR and track. Financed through AFG and projects started and completed in April 2024. Total amount of project \$ 170,000.  
501 Lewis Ave  
Gold Bar, WA 98251  
Assistant Chief Earnie Walters  
ewalters@snofire26.org  
425-330-3894
4. Cannon Beach Fire Department – Weidner has designed and installed MagneGrip systems in 2 stations with track. Financed through AFG and projects started and completed in February 2024. Total project amount \$ 110,000.  
188 E Sunset Blvd  
Cannon Beach, OR 97110  
Chief Marc Reckmann  
mreckmann@cbfire.com  
503-436-2949

**8. Start Date March 3rd**

|                                |                                                                                                                                                   |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Date:</b> 1/06/2025         | <b>Customer:</b> Glenwood Fire Department   <b>Contact:</b> David Reinhold<br><b>Phone:</b> (970) 319-7704   <b>Email:</b> david.reinhold@cogs.us |
| <b>Proposal #:</b><br>110624CO | <b>Address:</b> 806 Cooper Ave, Glenwood Springs, CO 81601                                                                                        |

> **Scope of Work:** Weidner Fire will provide a MagneGrip 100% source capture exhaust removal system. This turnkey proposal includes: site survey, equipment, installation, startup, and training.

> **Project Overview:** Three MagneGrip sliding flex track systems for back-in apparatus parking configuration. Wireless pressure sensors, control panel, and system fan. Total of three vehicle hose connections and 700 CFM per vehicle/hose connection.

| QTY           | P/N       | DESCRIPTION                                                                                                                                                                                                                                                                              | PRICE EA. | EXT. PRICE       |
|---------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------|
| 3             | SFTM 361  | MagneGrip 36 ft. sliding flex hose system, includes (6) sections of track, support legs, feet kits, slinky hose, 5" blue/white hose, 5" hi temp solid blue lower hose, knob handle, balancer, lifting elbow, pressure sensor, standard transmitter, 6" blast gate, and tailpipe adapter. | 5,800.00  | 17,400.00        |
| 1             | CF363-3   | MagneGrip Cincinnati fan/motor assembly, 3 HP, three phase, 2100 CFM at 6" sp, 10" inlet and outlet. Made in the USA.                                                                                                                                                                    | 4,600.00  | 4,600.00         |
| 1             | 500177-08 | MagneGrip control panel for 3 HP three phase fan, wireless capabilities, stop button, UL certified, NEMA 4 enclosure, variable timer, compatible with the above motor and fan.                                                                                                           | 1,675.00  | 1,675.00         |
| 1             | 500157-10 | MagneGrip 10" upblast and rain damper, specifically designed for exhaust removal systems, galvanized                                                                                                                                                                                     | 500.00    | 500.00           |
| 1             | 500151-10 | MagneGrip 10" x 30" exhaust silencer, specifically designed for exhaust removal systems.                                                                                                                                                                                                 | 700.00    | 700.00           |
| 1             | Install   | Install includes: travel, equipment installation, equipment rental, electrical installation, spiral duct, hardware, start up, calibration, and training.                                                                                                                                 | 19,989.29 | 19,989.29        |
| 1             | Freight   | Estimated shipping for delivery to zip code                                                                                                                                                                                                                                              | 3,000.00  | 3,000.00         |
| <b>TOTAL:</b> |           |                                                                                                                                                                                                                                                                                          |           | <b>47,864.29</b> |

*Delivery of system will be within 7 weeks of proposal acceptance. Quotation is valid for 90 days.*

**Payment Terms: Equipment portion of project due at time of order, balance due upon completion of installation and training.**

All material is guaranteed to be as specified. All work to be completed in a professional manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders and will become an extra charge over and above the quotation. All agreements contingent upon acts of God, such as severe acts of nature or weather events including floods, fires, earthquakes, hurricanes, explosions, war, acts of terrorism, epidemics, pandemics, strikes and labor disputes, or other delays beyond our control. Owner to carry fire, tornado, and other necessary insurance. Weidner Fire is licensed and insured according to all laws and regulations.

**Weidner Fire | 135 West 7065 South Midvale, UT 84047 | Tel: 801.565.9595 | weidnerfire.com**



## TERMS & CONDITIONS

### ***EXCLUSIONS TO THE PROJECT PROPOSED:***

1. Permits and fees of any kind are not included in this proposal; including but not limited to, any pertinent load calculations; technical drawings, submittals, shop drawings and permit drawings of any kind. Should any of these items be required, a separate quote will be required.
2. Outside services, not limited to but including, concrete work, exterior penetrations, fork or scissor lift rentals, etc. are not included, unless indicated in proposal.
3. Payment terms are noted on the proposal. Should you require different terms than noted, an addendum to this contract will need to be fully executed before revised terms will be accepted.
4. This proposal includes electrical work as quoted. Weidner Fire's electrical modifications to the building are specific to this project only, and include running wiring from building's existing electrical panel to exhaust system control panel, and from exhaust system control panel to fan and motor. Weidner Fire is assuming the building is currently equipped with electrical conditions sufficient to operate the proposed control panel and exhaust fan/motor. Electrical improvements/modifications required to enable proper operation of the proposed equipment are not the responsibility of Weidner Fire, but of the customer/owner of the building.
5. Weidner Fire is not responsible for installation of vehicle-mounted transmitter(s). If specified in proposal, Weidner Fire will provide hardware, with customer assuming responsibility and expense of installation on vehicles.

**SIGNATURE:** \_\_\_\_\_ **Date:** \_\_\_\_\_

*(Acceptance of Terms & Conditions)*

(Pages 1 and 2, inclusively.) The above prices, specifications, and Terms and Conditions are satisfactory and are hereby accepted. Weidner Fire is authorized to do the work as specified. By signing where indicated, \_\_\_\_\_, as agent for the organization proposed, hereby authorizes Weidner Fire to perform the work as specified on Page 1 of 2 of this proposal and agree and accept the Terms and Conditions (Page 2 of 2) of this proposal. Payment will be made as outlined above.



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Award Request for Proposal 2024-27P Wulfsohn Road Asphalt and Concrete Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Action Requested:</b>     | Council approval of RFP 2024-27P Wulfsohn Road Asphalt and Concrete project to Lions Construction as the lowest qualified bidder.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Department:</b>           | Public Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Presented By:</b>         | Matthew Langhorst                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Strategic Goals:</b>      | Preserve and Improve Infrastructure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Background Info:</b>      | <p>City staff has allocated funds from the Street and Infrastructure Tax to complete smaller street removal or overlay projects so that the surfacing of our roads is always being improved. For 2025, staff bid the partial removal and partial overlay of Wulfsohn Road from East Meadows Drive, heading east, back to Midland Avenue. This work will remove the failing sections of roadway and replace them with the heavy asphalt section used elsewhere on Wulfsohn Road, it will remove the asphalt bus stop in front of the Community Center and replace it with concrete, it will remove the failing concrete valley pan and curb sections at the intersection of Wulfsohn and Midland and lastly the project scope covers a 2" mill and overlay of the remaining sections of roadway so that we have a new street at the completion of the project. Staff and the contractor will work with the Community Center staff to keep one access open at all time, coordination with the hotels and commercial business adjacent to this section of roadway, communications will be completed with the apartments on Flat Tops View Drive and lastly RFTA will be brought into the discussion to continue bus service throughout the project in some fashion. Public Information will be sent out to the residents on roadway closures and detours as the schedule is finalized. The budget proposed for this work in 2025 was \$200,000. Staff was aware that the project may come in over budget, but finds the project to be worth the dollar amount. Staff will control the budgets for Red Mountain North Phase II and Blake Avenue Phase II to accommodate for the additional \$198,777.50 that will be needed to complete this project.</p> |
| <b>Issues:</b>               | None at this time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Fiscal Impact:</b>        | A change in the Street Overlay line item within the Street and Infrastructure Tax will need to be complete to accommodate for the bid being over the approved 2025 budget.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Legal Review:</b>         | None at this time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Staff Recommendation:</b> | Staff is recommending that Council approve, RFP 2024-27P Wulfsohn Road Asphalt and Concrete project, to Lions Construction as the lowest qualified bidder.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

**CITY OF GLENWOOD SPRINGS WULFSOHN ROAD ASPHALT AND CONCRETE PROJECT ITEM LIST - 2025 - Updated 1-14-2025**

| Item Number | CONTRACT ITEM                                             | UNIT | PROJECT UNITS |              | UNIT TOTAL    |
|-------------|-----------------------------------------------------------|------|---------------|--------------|---------------|
|             |                                                           |      | PLAN          | UNIT COST    |               |
| 1           | MOBILIZATION/PERMITTING                                   | LS   | 1             | \$ 4,000.00  | \$ 4,000.00   |
| 2           | REMOVAL OF ASPHALT MAT (5 INCH)                           | SF   | 9,000         | \$ 1.49      | \$ 13,410.00  |
| 3           | MILLING OF ASPHALT MAT - 2 INCH DEPTH                     | SF   | 31,150        | \$ 0.60      | \$ 18,690.00  |
| 4           | MILLING OF ASPHALT MAT - 2 FOOT WIDTH (2 INCH T-TOP)      | LF   | 130           | \$ 5.00      | \$ 650.00     |
| 5           | SAW CUTTING ASPHALT                                       | LF   | 130           | \$ 3.00      | \$ 390.00     |
| 6           | UNCLASSIFIED EXCAVATION (21 INCH DEPTH)                   | CY   | 650           | \$ 75.00     | \$ 48,750.00  |
| 7           | AGGREGATE BASE COURSE (CLASS 2 - 10 INCH DEPTH)           | CY   | 310           | \$ 90.00     | \$ 27,900.00  |
| 8           | AGGREGATE BASE COURSE (CLASS 6 - 10 INCH DEPTH)           | CY   | 310           | \$ 95.00     | \$ 29,450.00  |
| 9           | HOT MIX ASPHALT 2 INCH (GRADING SX (75)(PG 58-28)         | SF   | 31,150        | \$ 2.05      | \$ 63,857.50  |
| 10          | HOT MIX ASPHALT 6 INCH (GRADING SX (75)(PG 58-28)         | SF   | 8,100         | \$ 6.00      | \$ 48,600.00  |
| 11          | TRIAXIAL GEOFABRIC                                        | SF   | 9,000         | \$ 0.50      | \$ 4,500.00   |
| 12          | CENTERLINE STRIPING, 4" DOUBLE YELLOW, EPOXY              | LF   | 920           | \$ 4.00      | \$ 3,680.00   |
| 13          | TURN LANE 8" WHITE STRIPE, EPOXY                          | LF   | 225           | \$ 8.00      | \$ 2,400.00   |
| 14          | STOP BAR 24 INCH THERMAL PLASTIC, INLAID                  | LF   | 30            | \$ 400.00    | \$ 12,000.00  |
| 15          | CROSS WALKS, 24 INCH BARS AT 24 INCH SPACING              | EACH | 6             | \$ 2,000.00  | \$ 12,000.00  |
| 16          | CONCRETE APRON, VALLEY PAN AND CURB REMOVAL               | SF   | 1900          | \$ 5.00      | \$ 9,500.00   |
| 17          | CONCRETE APRON, VALLEY PAN, BUS STOP AND CURB REPLACEMENT | SF   | 2800          | \$ 27.50     | \$ 77,000.00  |
| 18          | MATERIAL TESTING                                          | LS   | 1             | \$ 6,000.00  | \$ 6,000.00   |
| 19          | TRAFFIC CONTROL                                           | LS   | 1             | \$ 16,000.00 | \$ 16,000.00  |
|             |                                                           |      |               | \$ -         | \$ -          |
|             | TOTAL BID:                                                |      |               |              | \$ 398,777.50 |



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Award Request for Proposal 2024-29P Coach Miller Drive and 14th Street Design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Action Requested:</b>     | Council approval to award Request for Proposal 2024-29P Coach Miller Drive and 14th Street Design to SEH, Inc for \$136,795.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Department:</b>           | Public Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Presented By:</b>         | Matthew Langhorst                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Strategic Goals:</b>      | Preserve and Improve Infrastructure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Background Info:</b>      | <p>The city Engineering and Public Works Director added the design of Coach Miller Drive to the Street and Infrastructure Tax list for 2025 in the last council meeting. The plan is to fast track the project design so that if the city is awarded a grant that we will be apply for, that the construction of the project could still happen during the summer of 2025. The street needs to be removed and replaced. The design will encompass a new sidewalk from 14th to Park Drive, a full stormwater system with curb, gutter and storm sewer, new roadway section construction, parking improvements at the RFTA trail connection and a new 8" waterline loop around the high school. Staff will work with SEH to complete the design in time, and if the grant is not awarded, we will have a complete plan set to bid for the 2026 summer season ready to go. The budget for 2025 out of the S&amp;IT was set at \$125,000. The Water Department will be kicking in \$25,000 out of its System Improvement funds, which will cover the proposed amount.</p> |
| <b>Issues:</b>               | None at this time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Fiscal Impact:</b>        | The project fits within budgeted amounts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Legal Review:</b>         | None at time time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Staff Recommendation:</b> | Staff is recommending Council approve the award of Request for Proposal 2024-29P Coach Miller Drive and 14th Street Design to SEH, Inc for \$136,795.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



# Proposed Budget

SEH and our subconsultants will provide engineering and professional services as outlined in our project approach. This includes the following:

1. Project management
2. Topographic survey and control
3. ROW plans
4. Geotechnical investigations and pavement design
5. SUE / utility investigations, including potholes as determined necessary
6. Roadway and traffic design
7. Drainage design (including drainage report)
8. Utility design (including water line and electrical infrastructure)
9. Maintenance of traffic / construction phasing plans
10. Erosion control / SWMP
11. Plans, specifications, and estimates (50%, 90% and Bid submittals)
12. Bidding Assistance

Scope of work exclusions include the following:

1. Temporary and permanent easements and/or right-of-way exhibits/descriptions
2. Site-specific water quality features
3. Improvements to 14th Street (east of Pitkin Avenue) other than pavement rehabilitation and re-establishing pavement markings
4. Any structural design, such as walls, stairways, and custom utility structures
5. Electrical design, such as wire and control panel sizing
6. Formal public meeting presentations. SEH can provide plan and cross section exhibits for one public meeting and/or outreach campaign.
7. SEH is hiring all geotechnical testing and related services as a convenience to the City of Glenwood Springs and assumes no risk or liability for those services performed by third parties, even if hired by SEH.

SEH acknowledges receipt of Addendum 1, 2, and 3

## Potential Additional Scope Items

Additional Potholing for Quality Level A  
Each Mobilization: \$2,000  
Each Pothole: \$1,500

Additional Curb Ramp and Driveway Cut Redesign for PROWAG Compliance  
Each ADA Ramp: \$1,200  
Each Driveway Cut: \$500

**TOTAL PROPOSED BUDGET: \$127,595**

+ requested (6) potholes \$9,200

**GRAND TOTAL BUDGET: \$136,795**

|                                                                                                                            | Roadway & Civil Staff                                                                                                                                                                                                                |              |              |             |             |             | Survey Staff |              |             |              | Equipment,<br>Expenses & Subs | Total       |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|-------------|-------------|-------------|--------------|--------------|-------------|--------------|-------------------------------|-------------|
|                                                                                                                            | Oliver                                                                                                                                                                                                                               | Nathan       | Molina       | Holloway    | Perez       | Wagner      | Kinker       | Christ       | Bartels     |              |                               |             |
|                                                                                                                            | \$185.00                                                                                                                                                                                                                             | \$225.00     | \$140.00     | \$140.00    | \$225.00    | \$140.00    | \$200.00     | \$145.00     | \$120.00    |              |                               |             |
| <b>Task a - Meetings (including Project Management)</b>                                                                    |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| a.1 Kick-off Meeting (includes attendance, agenda, & meeting minutes)                                                      | 6                                                                                                                                                                                                                                    | 2            | 2            | -           | -           | -           | -            | -            | -           | -            | -                             | 10          |
| a.2 Design Review Meetings (2 meetings total)                                                                              | 10                                                                                                                                                                                                                                   | 4            | 4            | -           | -           | -           | -            | -            | -           | -            | -                             | 18          |
| a.3 Weekly PM meeting (1 hr/each x 16 weeks)                                                                               | 16                                                                                                                                                                                                                                   | 8            | 8            | -           | -           | -           | -            | -            | -           | -            | -                             | 32          |
| a.4 Monthly Invoicing & Misc PM (2 hr/month x 5 month duration)                                                            | 10                                                                                                                                                                                                                                   | -            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 10          |
| Task a Total Fee                                                                                                           | \$7,770.00                                                                                                                                                                                                                           | \$3,150.00   | \$1,960.00   | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$0.00                        | \$12,880.00 |
| <b>Task b - Survey work for project scope</b>                                                                              |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| b.1 Establish survey control and perform topographic survey                                                                | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | 66           | -           | \$           | 3,700.00                      | 66          |
| b.2 Utility investigations and locating (excluding QL-A - see Task m)                                                      | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | \$           | 5,200.00                      | -           |
| Task b Total Fee                                                                                                           | \$0.00                                                                                                                                                                                                                               | \$0.00       | \$0.00       | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$9,570.00   | \$0.00      | \$8,900.00   | \$18,470.00                   |             |
| <b>Task c - Preliminary and final roadway section design</b>                                                               |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| c.1 Develop typical section alternatives                                                                                   | -                                                                                                                                                                                                                                    | 4            | 8            | -           | -           | -           | -            | -            | -           | -            | -                             | 12          |
| c.2 Section(s) assessment and recommendations                                                                              | -                                                                                                                                                                                                                                    | 4            | 4            | -           | -           | -           | -            | -            | -           | -            | -                             | 8           |
| c.3 Preliminary and final design of roadway section and related elements                                                   | -                                                                                                                                                                                                                                    | 4            | 8            | -           | -           | -           | -            | -            | -           | -            | -                             | 12          |
| Task c Total Fee                                                                                                           | \$0.00                                                                                                                                                                                                                               | \$2,700.00   | \$2,800.00   | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$0.00                        | \$5,500.00  |
| <b>Task d - ROW work</b>                                                                                                   |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| d.1 ROW research and delineation                                                                                           | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | 6            | 16           | 18          | \$           | 1,100.00                      | 40          |
| Task d Total Fee                                                                                                           | \$0.00                                                                                                                                                                                                                               | \$0.00       | \$0.00       | \$0.00      | \$0.00      | \$0.00      | \$1,200.00   | \$2,320.00   | \$2,160.00  | \$1,100.00   | \$6,780.00                    |             |
| <b>Task e - Water line design work</b>                                                                                     |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| e.1 Water line horizontal layout                                                                                           | 4                                                                                                                                                                                                                                    | -            | 8            | -           | -           | -           | -            | -            | -           | -            | -                             | 12          |
| e.2 Assess and detail connections, vertical deflections, utility conflicts, etc                                            | 8                                                                                                                                                                                                                                    | -            | 16           | -           | -           | -           | -            | -            | -           | -            | -                             | 24          |
| e.3 Plan and profile production                                                                                            | 8                                                                                                                                                                                                                                    | -            | 32           | -           | -           | -           | -            | -            | -           | -            | -                             | 40          |
| e.4 Tabulations and specifications                                                                                         | 8                                                                                                                                                                                                                                    | -            | 4            | -           | -           | -           | -            | -            | -           | -            | -                             | 12          |
| Task e Total Fee                                                                                                           | \$5,180.00                                                                                                                                                                                                                           | \$0.00       | \$8,400.00   | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$0.00                        | \$13,580.00 |
| <b>Task f - Electric line design work</b>                                                                                  |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| f.1 Electrical conduit and structure layout                                                                                | 2                                                                                                                                                                                                                                    | -            | 6            | -           | -           | -           | -            | -            | -           | -            | -                             | 8           |
| f.2 Assess and detail connections, vertical deflections, utility conflicts, etc                                            | 2                                                                                                                                                                                                                                    | -            | 4            | -           | -           | -           | -            | -            | -           | -            | -                             | 6           |
| f.3 Plan production                                                                                                        | -                                                                                                                                                                                                                                    | -            | 6            | -           | -           | -           | -            | -            | -           | -            | -                             | 6           |
| f.4 Tabulations and specifications                                                                                         | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 0           |
| Task f Total Fee                                                                                                           | \$740.00                                                                                                                                                                                                                             | \$0.00       | \$2,240.00   | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$0.00                        | \$2,980.00  |
| <b>Task g - Roadway design work</b>                                                                                        |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| g.1 Horizontal design development                                                                                          | -                                                                                                                                                                                                                                    | 12           | 16           | -           | -           | -           | -            | -            | -           | -            | -                             | 28          |
| g.2 Vertical design development (roadway profile and modeling)                                                             | -                                                                                                                                                                                                                                    | 10           | 32           | -           | -           | -           | -            | -            | -           | -            | -                             | 42          |
| g.3 Roadway Plan and Profile                                                                                               | -                                                                                                                                                                                                                                    | 4            | 24           | -           | -           | -           | -            | -            | -           | -            | -                             | 28          |
| g.4 Removal Plans                                                                                                          | -                                                                                                                                                                                                                                    | 1            | 8            | -           | -           | -           | -            | -            | -           | -            | -                             | 9           |
| g.5 Traffic (Signing & Striping) Plans                                                                                     | -                                                                                                                                                                                                                                    | -            | -            | -           | 8           | -           | -            | -            | -           | -            | -                             | 8           |
| g.6 Maintenance of Traffic / Traffic Control                                                                               | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 0           |
| g.7 Cross Sections                                                                                                         | -                                                                                                                                                                                                                                    | 4            | 24           | -           | -           | -           | -            | -            | -           | -            | -                             | 28          |
| g.8 Tabulations and specifications                                                                                         | -                                                                                                                                                                                                                                    | 8            | 24           | -           | -           | 2           | -            | -            | -           | -            | -                             | 34          |
| g.9 Miscellaneous plans (cover sheet, general notes, etc)                                                                  | -                                                                                                                                                                                                                                    | -            | 26           | -           | -           | -           | -            | -            | -           | -            | -                             | 26          |
| g.10 Quality Control / Internal design reviews (for all design tasks)                                                      | 4                                                                                                                                                                                                                                    | -            | -            | -           | 8           | -           | -            | -            | -           | -            | -                             | 12          |
| Task g Total Fee                                                                                                           | \$740.00                                                                                                                                                                                                                             | \$8,775.00   | \$21,560.00  | \$0.00      | \$1,800.00  | \$1,400.00  | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$0.00                        | \$34,275.00 |
| <b>Task h - Sidewalk design work</b>                                                                                       |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| h.1 Existing sidewalk assessment                                                                                           | -                                                                                                                                                                                                                                    | 2            | 2            | -           | -           | -           | -            | -            | -           | -            | -                             | 4           |
| h.2 Curb ramp design (4 proposed locations only)                                                                           | -                                                                                                                                                                                                                                    | 2            | 12           | -           | -           | -           | -            | -            | -           | -            | -                             | 14          |
| h.3 Sidewalk and parking lot layout for Rio Grande Trail                                                                   | -                                                                                                                                                                                                                                    | 2            | 8            | -           | -           | -           | -            | -            | -           | -            | -                             | 10          |
| h.4 All other typical sidewalk design to be completed with roadway design task                                             | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 0           |
| Task h Total Fee                                                                                                           | \$0.00                                                                                                                                                                                                                               | \$1,350.00   | \$3,080.00   | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$0.00                        | \$4,430.00  |
| <b>Task i - Drainage design work</b>                                                                                       |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| i.1 Drainage report - assessment and documentation of existing conditions proposed improvements (hydrology and hydraulics) | 4                                                                                                                                                                                                                                    | -            | -            | 16          | -           | -           | -            | -            | -           | -            | -                             | 20          |
| i.2 Layout of drainage pipes, inlet, manholes, ditches, etc.                                                               | 4                                                                                                                                                                                                                                    | -            | -            | 8           | -           | -           | -            | -            | -           | -            | -                             | 12          |
| i.3 Plan and profile of drainage improvements                                                                              | 4                                                                                                                                                                                                                                    | -            | -            | 24          | -           | -           | -            | -            | -           | -            | -                             | 28          |
| i.4 Water quality recommendations and general notes/ details                                                               | 4                                                                                                                                                                                                                                    | -            | -            | 4           | -           | -           | -            | -            | -           | -            | -                             | 8           |
| i.5 Stormwater management plans (SWMP)                                                                                     | 4                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 0           |
| i.6 Tabulations and specifications                                                                                         | 4                                                                                                                                                                                                                                    | -            | -            | 8           | -           | -           | -            | -            | -           | -            | -                             | 12          |
| Task i Total Fee                                                                                                           | \$3,700.00                                                                                                                                                                                                                           | \$0.00       | \$0.00       | \$8,400.00  | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$0.00                        | \$12,100.00 |
| <b>Task j - Geotechnical work</b>                                                                                          |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| j.1 Field borings of existing pavement (5 total, 10' deep)                                                                 | Geotechnical work, including engineering staff, field exploration, and laboratory testing, to be provided at cost of \$6500. Justification will be provided for authorization of any work exceeding this fee. Fee schedule included. |              |              |             |             |             |              |              |             |              |                               |             |
| j.2 Laboratory testing and assessment                                                                                      |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| j.3 Geotech report with pavement section recommendations                                                                   |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| Task j Total Fee                                                                                                           | \$0.00                                                                                                                                                                                                                               | \$0.00       | \$0.00       | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$6,500.00                    | \$6,500.00  |
| <b>Task k - Additional scope items</b>                                                                                     |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| k.1 Existing utility structure evaluations (assume 12 structures)                                                          | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 0           |
| k.2 Engineer's estimate / opinion of probable cost                                                                         | 2                                                                                                                                                                                                                                    | 8            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 10          |
| k.3 Compiling & submitting deliverables (3 milestone submittals)                                                           | 4                                                                                                                                                                                                                                    | 4            | 15           | -           | -           | -           | -            | -            | -           | -            | -                             | 23          |
| k.4 Bidding support                                                                                                        | 8                                                                                                                                                                                                                                    | 6            | 4            | -           | -           | -           | -            | -            | -           | -            | -                             | 18          |
| k.5 Travel related expenses                                                                                                | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | \$           | 800.00                        | 0           |
| k.6 Plan production and courier expenses                                                                                   | -                                                                                                                                                                                                                                    | -            | -            | -           | -           | -           | -            | -            | -           | -            | -                             | 0           |
| Task k Total Fee                                                                                                           | \$2,590.00                                                                                                                                                                                                                           | \$4,050.00   | \$2,660.00   | \$0.00      | \$0.00      | \$0.00      | \$0.00       | \$0.00       | \$0.00      | \$0.00       | \$800.00                      | \$10,100.00 |
| TOTALS                                                                                                                     | 112                                                                                                                                                                                                                                  | 89           | 305          | 60          | 8           | 10          | 6            | 82           | 18          | -            | 690                           |             |
|                                                                                                                            | \$ 20,720.00                                                                                                                                                                                                                         | \$ 20,025.00 | \$ 42,700.00 | \$ 8,400.00 | \$ 1,800.00 | \$ 1,400.00 | \$ 1,200.00  | \$ 11,890.00 | \$ 2,160.00 | \$ 17,300.00 | \$ 127,595.00                 |             |
| <b>Requested tasks - scope to be determined after preliminary design</b>                                                   |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| <b>Task m - Quality Level A utility investigations (potholing)</b>                                                         |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               |             |
| QL-A potholing cost of \$9200 estimated assuming 6 potholes (\$2000 mobilization + \$1200 per each pothole)                |                                                                                                                                                                                                                                      |              |              |             |             |             |              |              |             |              |                               | \$ 9,200.00 |



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Award Request for Proposal 2024-30P Citywide Street Striping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Action Requested:</b>     | Council approval to award Request for Proposal 2024-30P city wide street striping to Stripes a Lot for \$58,715.90 with the ability to extend the contract for up to three more years upon staff recommendations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Department:</b>           | Public Works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Presented By:</b>         | Matthew Langhorst                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Strategic Goals:</b>      | Preserve and Improve Infrastructure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Background Info:</b>      | The streets department awards the city wide striping to a qualified contractor every 3 to 4 years to stripe city streets at the beginning of the summer months for traffic control and safety. This year one bidder responded to the RFP, but that bidder is the contractor that has been striping the streets for the last 4 years. Current budget for striping within the street tax is \$45,000 which would normally have covered the striping requirements, but this year we proposed to have all centerlines, turn lanes, and all bike lanes refreshed to bring the city back up to our standards. Staff can move budget from crack sealing to this line item to cover the overage and we will plan for 2026 at this level to repaint all stripes each year. |
| <b>Issues:</b>               | None at this time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Fiscal Impact:</b>        | Small adjustment to the striping budget, which can be accommodated for within the overall budget.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Legal Review:</b>         | None at this time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Staff Recommendation:</b> | Staff would recommend council approve the award for, Request for Proposal 2024-30P city wide street striping, go to Stripes a Lot for \$58,715.90 with the ability to extend the contract for up to three more years upon staff recommendations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |







P.O. Box 1957  
Montrose, CO. 81402  
Office: 970-249-7588  
Cell : 970-275-9102  
Email: [stripealotinc@msn.com](mailto:stripealotinc@msn.com)

26 January 2025

City of Glenwood Springs  
RFP 2024-30P  
Citywide Street Striping Plan

To Whom it May Concern,

We are writing to express our interest in the upcoming 2025 Citywide Street Striping Plan, City of Glenwood Springs. As the owner of Stripe A Lot, Inc., a reputable striping company with a solid 20-year track record, I believe that our experience, commitment to quality, and familiarity with the local roadways make us the ideal choice for this project.

Stripe A Lot was established in 2005, and throughout the past 20 years, we have accumulated extensive expertise in pavement marking and related services throughout Colorado. We are particularly proud of our long-standing relationship with the City Glenwood Springs. Our crew possesses an understanding of the town's layout, and we have developed a strong partnership with the Public Works Department.

As a company deeply rooted in Colorado, we take pride in the quality of our workmanship. Our commitment to excellence extends beyond the technical aspects of striping, including line removal, inlaid thermoplastic, crosswalks, and stop bars.

At Stripe A Lot, we prioritize customer service and effective communication. Our goal is not only to meet but exceed your expectations, ensuring a smooth and collaborative process from project initiation to completion.

We appreciate your time and consideration.

Kind Regards,

A handwritten signature in black ink that reads "Denise C. Allison".

Denise C. Allison, President/Owner  
Stripe A Lot, Inc.



**STRIPE A LOT, INC.**  
P.O. Box 1957  
Montrose, CO. 81402  
Office: 970-249-7588  
Email: [stripealotinc@msn.com](mailto:stripealotinc@msn.com)

**PROJECT CONSTRUCTION SCHEDULE**  
**2025 Citywide Street Striping Plan – City of Glenwood Springs, CO**

**Material Delivery:**

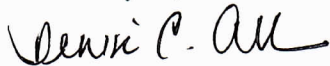
If are awarded the bid, upon receiving the Notice to Proceed, we will order the product (paint/beads).

**Timetable:**

Striping will be completed by late May

Weather permitting, the striping should take approximately 2 days.

Thank you,



**Denise C. Allison, President/Owner**  
**Stripe A Lot, Inc.**



P.O. Box 1957  
Montrose, CO. 81402  
Office: 970-249-7588  
Email: [stripealotinc@msn.com](mailto:stripealotinc@msn.com)

RFP – Citywide Street Striping Plan  
RFP Number: 2024-30P  
City of Glenwood Springs Procurement Department

#### CONTRACTOR INFORMATION

Stripe A Lot, Inc.

Incorporated: 8 JULY 2005 COLORADO

Services: Pavement Marking Waterbase & Epoxy, Line Removal, ThermoPlastic, Traffic Control Device Rental.

Main Office: P.O. Box 1957, Montrose, CO 81401

Staff: 6

Experience: 20 years

Warranty: 1 year

STRIPE A LOT, INC.

***References:***

City of Montrose: Nik Pridy (970) 240-1443

Montrose County: Sean Tafoya (970) 249-5423

Rio Blanco County: Clint Chappell (970) 878-9590

City of Rifle: Colton Secary (970) 665-6476

Moffat County: Bruce White (970) 824-3211

City of Glenwood Springs: Matthew Langhorst (970) 384-6438  
Jake Swindell (970) 384-6372

*\*Additional references available upon request*



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Intergovernmental Agreement with Garfield County Regarding the April 1, 2024 Municipal Election

**Action Requested:** Approval of the Intergovernmental Agreement (IGA) with the County for the municipal election.

**Department:** City Clerk

**Presented By:** Ryan Muse

**Strategic Goals:** Provide Efficient and Responsive City Government

**Background Info:** The City needs to execute an agreement with the Clerk and Recorder's office of Garfield County to help collect and count the ballots in the upcoming municipal election.

**Issues:** None

**Fiscal Impact:** \$1,500 from the General Fund in 2025.

**Legal Review:** Legal approved the agreement.

**Staff Recommendation:** Execution of Intergovernmental Agreement with Garfield County.

## INTERGOVERNMENTAL AGREEMENT FOR ELECTION SERVICES

This Intergovernmental Agreement for election services is entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2025, by and between the, City of Glenwood Springs, a Colorado Home Rule Municipality (hereinafter the “City”), and the Garfield County Clerk & Recorder, (hereinafter the “Clerk”), collectively referred to as the “Parties”.

WHEREAS the City has requested assistance from the Clerk for the Municipal Election to be held on April 1, 2025, (hereinafter the “Election”) and

WHEREAS the Clerk is willing to assist the City in certain aspects of the Election to effectuate a smooth and efficient election process.

NOW THEREFORE, for and in consideration of the mutual covenants and agreements of the parties as set forth herein, the Parties agree as follows:

1. **Term of Agreement:** This agreement applies to the April 1, 2025, Municipal Election and is effective from the date of execution to the conclusion of any appeal or contest of the Election.
2. **Clerk’s Duties:** The Clerk agrees to:
  - a. Conduct CBI background checks for all Clerk staff assisting with the Election. Copies of these checks are available on request.
  - b. Use the ballot content provided by the City to design the ballot for the Election. When completed, the Clerk will send the ballot proof to the City by email for final approval.
  - c. Once the ballot is approved by the City, the Clerk will email the City’s designated print vendor a pdf file of the approved ballot for printing of the ballot test deck to be used in the logic and accuracy test (LAT). If changes to the ballot are required after the LAT, the Clerk will send the final pdf ballot proof to both the City and the City’s designated print vendor.
  - d. In partnership with City representatives, conduct the logic and accuracy test (LAT) prior to the City’s designated print vendor printing any ballots for voters.
  - e. Provide the City and the City’s designated print vendor with the ballot label extract for both the UOCAVA (military and overseas voters) and main ballot mailings on the date agreed upon by the City and print vendor. This extract will be in a txt format.
  - f. Provide the City with supplemental ballot extracts via email for voters who register to vote or submit a change of address after the initial voter extract is sent to the designated print vendor. This extract will be sent in a txt format and will be sent at a frequency requested by the City. The final extract will be sent on the last day the City can mail ballots to voters as specified by statute.
  - g. Allow City voters to drop off voted ballots in the Garfield County 24/7 ballot drop box on 8<sup>th</sup> Street. Monday through Thursday, one Clerk staff will meet two City staff/election judges at the drop box at an agreed time in order for the City to collect ballots from the box. After picking up ballots on Thursday, the Clerk will post a sign on the drop box indicating the box will not be checked again until the following Monday (since the City is closed on Fridays).
  - h. At 7 pm on Election night, one Clerk staff will go with two City staff/election judges to cover the 24/7 ballot drop box on 8<sup>th</sup> Street. The Clerk will provide the cover for the drop box.

- i. Provide a Clear Ballot Municipal Kit (laptop, scanner and Clear Count software) to scan and tabulate the voted ballots. Clerk election staff will transport the Municipal Kit to the Glenwood Springs City Hall in the late afternoon on Election day and will work with the City's staff and election judges to scan all voted ballots received by 7 pm and accepted by the City's election judges.
  - j. Provide written guidance to the City on how to prepare the ballots for scanning and tabulation with the Clear Ballot Municipal Kit.
  - k. Once all the voted ballots are scanned on Election night, the Clerk will tabulate election results and provide reports to the City.
  - l. Eight days post-election, the City will bring any unscanned ballots to the Clerk's office for scanning and tabulation of final results.
  - m. Invoice the City a flat fee of \$1,500.00 within two (2) weeks of the Election. This fee covers: Clerk staff time spent in setting up the ballot, logic and accuracy testing, providing the designated print vendor with the ballot pdf and ballot label extracts, general office supplies needed for logic and accuracy testing, scanning and tabulation of all ballots (election night and eight days post-election), and for use of the Clear Ballot Municipal Kit. Any items provided to the City for their use in conducting the Election will be charged separately (i.e. UOCAVA envelopes).
  - n. If any contest is close enough for a recount, the Clerk will charge the City an additional amount to cover staff time needed to assist with the recount process.
3. **City's Duties:** The City agrees to:
- a. Email the Clerk (Jacklyn Harmon – [jharmon@garfield-county.com](mailto:jharmon@garfield-county.com)) contact information (name, email and phone number) for primary and secondary points of contact for the Election.
  - b. Provide the Clerk with certified ballot content as soon as possible once the ballot language is approved by the City Council. Please contact Edna Place at 970-384-3700 x 1804 or [eplace@garfield-county.com](mailto:eplace@garfield-county.com) for the format required for content certification.
  - c. Proof and return signed verification that the ballot proof is acceptable by email to the Clerk (Jacklyn Harmon - [jharmon@garfield-county.com](mailto:jharmon@garfield-county.com)) and Edna Place ([eplace@garfield-county.com](mailto:eplace@garfield-county.com)) as soon as possible after receipt of the ballot proof.
  - d. Conduct all required background checks for City staff and election judges.
  - e. Provide Clerk election staff with the name and contact information for the City's designated print vendor.
  - f. Work with Deputy Clerk, Edna Place to set the date for the logic and accuracy testing (LAT).
  - g. Coordinate with the City's designated print vendor to have a ballot test deck printed for use in the LAT.
  - h. Provide at least two staff members or election judges to assist with logic and accuracy testing of the Clear Ballot Municipal Kit. This testing will be done at the Clerk's office in Glenwood Springs. The LAT is conducted to verify that the equipment in the Municipal Kit is correctly scanning and tabulating the marked ballots.
  - i. Mark and hand tally all ballots to be used in the LAT. These ballots are to be transported between the City and Clerk's office in a sealed container.
  - j. Upon completion of the LAT, communicate with City's designated print vendor that the ballot is final and ready for printing.
  - k. Prepare ballots for scanning according to the written guidance from the Clerk.
  - l. Provide the Clerk a new, encrypted flash drive so all reports for the election can be downloaded from the Clear Ballot Municipal Kit for the City's use.

- m. Once ballots have been mailed out, send two City staff or election judges to meet Clerk staff at the Garfield County 24/7 ballot box on 8<sup>th</sup> Street to collect ballots. This is to be done daily, Monday through Thursday. Since the City is closed on Fridays, the ballot box will not be checked on Fridays. The City will provide the necessary ballot box to transport the ballots back to their office.
  - n. Eight days post-election, two City staff or election judges to bring any remaining ballots to scan to the Clerk's office for final scanning and tabulation.
  - o. Reimburse the Clerk a flat fee of \$1,500.00 for assisting with the Election. Any items provided to the City for their use in conducting the Election will be charged separately (i.e. UOCAVA envelopes).
  - p. If any race is close enough for a recount, the City agrees to reimburse the Clerk for staff time needed to assist with the recount process.
4. **Indemnification:** The City agrees to indemnify, defend and hold harmless the Clerk from any and all loss, costs, demands or actions, arising out of or related to any actions, errors or omissions of the City in completing its responsibilities relating to the election.
  5. **Integration:** The Parties acknowledge that this Agreement constitutes the complete agreement and understanding between them relating to the subject matter hereof and that no Party is relying upon any oral representations made by another Party or employee, agent or officer of the Party.
  6. **Amendments:** This Agreement can be amended only in writing with signature of all Parties.
  7. **Notices:** All notices, requests, demands, consents, and other communications pertaining to this Agreement shall be transmitted in writing and shall be deemed duly given when received by the Parties at their addresses below or agreed upon email addresses as provided to the other party below: City of Glenwood Springs, 101 W 8<sup>th</sup> St, Glenwood Springs, CO 81601 and Garfield County Clerk, 109 8<sup>th</sup> St, Suite 200, Glenwood Springs, CO 81601.

IN WITNESS WHEREOF, the City and the Clerk have caused this Agreement to be fully executed in an electronic format or duplicate signed originals with each party receiving a fully executed copy.

ATTEST:

City of Glenwood Springs

\_\_\_\_\_  
City Clerk

By:

\_\_\_\_\_  
Mayor

Dated: \_\_\_\_\_

Garfield County Clerk & Recorder

Email: \_\_\_\_\_

\_\_\_\_\_  
Jacklyn K. Harmon

Dated

Email: [jharmon@garfield-county.com](mailto:jharmon@garfield-county.com)



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Second Amendment to Memorandum of Understanding with Habitat for Humanity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Action Requested:</b>     | Approval of second amendment to the Memorandum of Understanding with Habitat for Humanity Roaring Fork.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Department:</b>           | Economic and Community Development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Presented By:</b>         | Hannah Klausman                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Strategic Goals:</b>      | Protect and Preserve our Quality of Life<br>Generate Sustainable Economic Development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Background Info:</b>      | <p>Council approved a memorandum of understanding with Habitat for Humanity in December 2022 for the development of two City-owned parcels for affordable and workforce housing. Since that time Habitat for Humanity received entitlement to build a for-sale townhome project on property located at 8th and Midland Avenue.</p> <p>Since the time of execution, there have been significant changes to the project, including the determination that the Iddings Parcel, located on Airport Road, is not suitable for development, as well as major construction cost increases. Due to the changing situation, Habitat has proposed amendments for consideration to maintain the project's financial feasibility and function.</p> <p>City Council reviewed the proposed changes at its January 2, 2025 regular meeting and approved the amendment including the following changes:</p> <ol style="list-style-type: none"><li>1. Removal of all mention of the Iddings parcel, or mention of "two" projects.</li><li>2. The 8<sup>th</sup> and Midland Project unit count is reduced to 6 total units.</li><li>3. The City of Glenwood Springs will pay Habitat \$150,000 for the allocation of one priority unit for City of Glenwood Springs Employees.</li><li>4. Habitat may allow up to two units for outside organization priority units.</li><li>5. The City agrees that Habitat's L3 project, once condominiumized and available for sale, can be utilized for the pool of units offered up in the priority unit process.</li><li>6. The Area Median Income limit is increased to 100% Area Median Income.</li><li>7. The average initial target sales price is increased to \$375,000.</li><li>8. All other terms and conditions of the January 30, 2023 MOU shall remain in effect and unchanged.</li></ol> <p>These approved changes are reflected in the attached Second Amendment to Memorandum of Understanding with Habitat for Humanity Roaring Fork.</p> |
| <b>Issues:</b>               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Fiscal Impact:</b>        | The City will pay an additional \$150,000 for a priority unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Legal Review:</b>         | Legal has reviewed the Amendment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Staff Recommendation:</b> | Staff recommends approval of the Amendment document as the changes were approved by Council on January 2, 2025.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



## SECOND AMENDMENT TO MEMORANDUM OF UNDERSTANDING

This Amendment to Memorandum of Understanding ("First Amendment") is made and entered into this \_\_\_\_ day of \_\_\_\_\_ 2025, by and between the City of Glenwood Springs, a Colorado home rule municipality (the "City"), and Habitat for Humanity of the Roaring Fork Valley, Inc., a Colorado nonprofit corporation ("Habitat").

WHEREAS, on January 30, 2023, the Parties entered into a Memorandum of Understanding (the "MOU"); and

WHEREAS, on April 4, 2024, the Parties amended the Memorandum of Understanding to reflect the determination that the Airport Road Project a/k/a the Iddings Parcel was not suitable for development; and

WHEREAS, on January 2, 2025 City Council approved amending the Memorandum of Understanding in light of higher project costs and associated gaps in funding necessary for project feasibility, and

WHEREAS, on January 2, 2025 City Council approved obtaining one priority unit for City of Glenwood Springs employees as allowed in the MOU, and

WHEREAS, the Parties desire to enter into this Second Amendment to the MOU on the terms and conditions stated herein.

NOW THEREFORE, for valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. The 8<sup>th</sup> and Midland Project unit count is reduced to 6 total units.
2. The City of Glenwood Springs will pay Habitat \$150,000 for the allocation of one priority unit for City of Glenwood Springs Employees.
3. Habitat may allow up to two units for outside organization priority units.
4. The City agrees that Habitat's L3 project, once condominiumized and available for sale, can be utilized for the pool of units offered up in the priority unit process.
5. The Area Median Income limit is increased to 100% Area Median Income.
6. The average initial target sales price is increased to \$375,000.
7. All other terms and conditions of the January 30, 2023 MOU shall remain in effect and unchanged.

CITY OF GLENWOOD SPRINGS, COLORADO

By: \_\_\_\_\_  
Ingrid Wussow, Mayor

ATTEST:

\_\_\_\_\_  
Ryan Muse, City Clerk

HABITAT FOR HUMANITY OF THE ROARING FORK VALLEY, INC

By: \_\_\_\_\_  
\_\_\_\_\_, President



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Ordinance 2025-02; Changing the Name of the Street Tax Fund. Second Reading

**Action Requested:** Approval of ordinance to change the name of the street tax fund.

**Department:** City Administration

**Presented By:** Steve Boyd

**Strategic Goals:** Provide Efficient and Responsive City Government

**Background Info:** With the passage of the new street tax the name of the fund needs to include the word infrastructure.

**Issues:** None at this time.

**Fiscal Impact:** None.

**Legal Review:** Legal drafted the ordinance.

**Staff Recommendation:** Staff recommends approval.

## ORDINANCE NO. 02

Series of 2025

### AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, AMENDING ORDINANCE 25 SERIES OF 2024 RE NAMING SECTION 040.010.040 (d) OF THE GLENWOOD SPRINGS MUNICIPAL CODE.

**WHEREAS**, the City of Glenwood Springs (“Glenwood Springs” or the “City”) is a home-rule municipality organized under Article XX of the Colorado Constitution and with the authority of the Glenwood Springs Home Rule Charter (the “Charter”); and

**WHEREAS**, by Resolution No. 25, Series 2024, the Glenwood Springs City Council (the “City Council”) referred to the City’s electorate a ballot question to levy a total tax of 1 cent on sales and use comprised of the renewal of the current half cent tax and an additional new half cent tax; and

**WHEREAS**, by Ordinance No. 19 Series 2024, the City Council declared the repeal and replacement of 040.010.040 (d) of the Glenwood Springs Municipal Code (the “Code”); and

**WHEREAS**, the City Council wishes to amend Exhibit A of Ordinance No. 25 Series 2024 to more fully align with the purpose of the tax; and

**WHEREAS**, the City Council finds and declares that **Exhibit A**, of Ordinance No. 25 Series 2024 should be amended as set forth in **Exhibit A** attached hereto and incorporated by this reference implements the will of the City’s electors by providing for the levy of such taxes in the event that the electors approve, is in the best interests of the City.

### **NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ORDAINS:**

**Section 1.**     **Recitals.** The foregoing recitals are incorporated herein as if set forth in full.

**Section 2.**     **Amendment.** Exhibit A of Ordinance 25, Series 2024 is hereby amended as set forth in the attached Exhibit A. All other provisions of Ordinance 25, Series 2024 shall remain in effect as adopted.

INTRODUCED, READ ON FIRST READING, PASSED AND ORDERED PUBLISHED BY  
TITLE ONLY THIS \_\_\_\_ DAY OF SEPTEMBER 2024.

CITY OF GLENWOOD SPRINGS, COLORADO

\_\_\_\_\_  
Ingrid Wussow, Mayor

ATTEST:

\_\_\_\_\_  
Ryan Muse, City Clerk

INTRODUCED, READ ON SECOND READING, AND ORDERED PUBLISHED BY  
TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND  
PUBLICATION THIS \_\_\_\_ DAY OF \_\_\_\_\_ 2024.

CITY OF GLENWOOD SPRINGS, COLORADO

\_\_\_\_\_  
Ingrid Wussow, Mayor

ATTEST:

\_\_\_\_\_  
Ryan Muse, City Clerk

## EXHIBIT A

The following sections of the Municipal Code are amended as follows with double underlined text added and ~~strike through text~~ deleted.

### **040.010.040 Purpose of tax; use of proceeds.**

\* \* \* \*

- (d) ~~Street Maintenance and Construction~~ and Infrastructure Tax. (1) The City Council hereby levies a one cent (0.01) sales and use tax which was approved by the electors of Glenwood Springs at the November 2024 election and which tax shall expire at midnight on December 31, 2044. There is hereby created a special separate fund to be known as the ~~Street Maintenance and Construction~~ and Infrastructure Tax Fund into which all funds from the tax shall be deposited. Said Fund shall be separate and distinct from any other funds or accounts used or maintained by the City for any other purposes. The monies of said fund shall be expended only for the purposes set forth herein and no other and shall be expended as provided for herein.

\* \* \* \*



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Youth Tobacco Use

**Action Requested:** Peter Mueller, of Pitkin County, and Health Program Administrator for the Tobacco Education Prevention Partnership - Parachute to Aspen, will present some good news on youth tobacco use and the positive effects of Glenwood Springs Ordinances 2019-21, 2019-26 and Resolution 2019-34.

**Department:** City Administration

**Presented By:** Steve Boyd

**Strategic Goals:** Provide Efficient and Responsive City Government  
Protect and Preserve our Quality of Life  
Ensure Public Safety

**Background Info:** In 2019, City Council passed two ordinances and a resolution with the hope to stem youth tobacco use.

**Issues:** NA

**Fiscal Impact:** NA

**Legal Review:** NA

**Staff Recommendation:** NA



**Peter Mueller,  
Pitkin and Garfield Counties' Public  
Health, State Tobacco Education and  
Prevention Partnership (STEPP)**



# Glenwood Springs - Tobacco Retail License update

## February 6, 2025

### Goals in 2019

- Restrict youth access to tobacco
- Flavor Ban - Diminish the appeal of tobacco products
- Increase the cost
- Comply with State law including increasing the minimum age to 21
- Support schools' prevention education and restorative response to infractions - no MIP
- Promote youth and adult cessation: [COquitline.org](https://www.COquitline.org)



# Glenwood Springs - TOBACCO PRODUCT RETAIL LICENSE

## 050.110.010 - Purpose and applicability.

The purpose of this article is to establish license requirements for tobacco product and tobacco paraphernalia **retailers** and to set forth the **requirements for** the sale of tobacco products and tobacco paraphernalia to persons under twenty-one (21) years of age to **protect the health**, safety and welfare of individuals in the City, to encourage responsible tobacco and tobacco paraphernalia retailing and to **reduce illegal sales** of said products in Glenwood Springs, Colorado.

## Tobacco Ordinance Fact Sheet -

<https://www.cogs.us/DocumentCenter/View/6077/Tobacco-Ordinance-Fact-Sheet>

# Tobacco Ordinance Fact Sheet

## City of Glenwood Springs

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### Overview

Glenwood Springs City Council recently passed new legislation regarding tobacco laws in Glenwood Springs city limits.

#### Resolution 2019-34

- Establishment of licensing requirements for the retail sale of tobacco products. All tobacco retailers must have a license through the City of Glenwood Springs and pay a \$1,000 initial licensing fee to sell tobacco and a \$500 annual renewal fee. In effect on January 1, 2020.

#### Ordinance no. 21, series of 2019.

- Raised the minimum legal sale age of tobacco products from 18 to 21 years of age. In effect September 15, 2019.
- Prohibits the sale of all flavored tobacco products. In effect October 15, 2019.

#### Ordinance no. 26, series of 2019.

- Permits persons 18 years of age and older to handle tobacco products in the course of

# And, How Has It Gone?

# Glenwood Springs High School

## Healthy Kids Colorado Survey

| Healthy Kids Survey, GSHS                                                 | 2019 | 2021 | 2023 | Difference from '19 to '23                                                              |
|---------------------------------------------------------------------------|------|------|------|-----------------------------------------------------------------------------------------|
| Smoked in the last 30 days                                                | 7.1  | 3.2  | 5.2  | 27%  |
| Easy to get e-cigarettes                                                  | 69   | 58.8 | 53   | 23%  |
| Vaped in last 30 days                                                     | 28.4 | 17.6 | 12.4 | 56%  |
| Tried to quit                                                             | 59.5 | 56.7 | 58.3 | 2%   |
| Of those minors trying to purchase tobacco products, % <b>not</b> refused |      |      | 78.4 | Revisit - Retailer compliance checks for underage buyers                                |

## Additional Regional Work - Consistent Enforcement

- Advocate for Tobacco Retail Licenses: New Castle, Silt, Rifle, Parachute and Garfield County:
  - Local Compliance Checks, collaborate with retailers
  - Cap retailers
  - Affirm 500' from youth serving orgs
  - Restrict advertising
- Implement Restorative approaches to tobacco infractions in schools; [secondchancetobacco.org](https://secondchancetobacco.org)
- Engage Youth: support Access After School; the Buddy Program, YouthZone
- Complete and distribute Anti-Vaping and Student Resilience video

## Additional Regional Work to Reduce Tobacco Use

- Advocate for Tobacco Retail Licenses: New Castle, Silt, Rifle, Parachute and Garfield County:
  - Local Compliance Checks, collaborate with retailers
  - Cap retailers
  - Affirm 500' from youth serving orgs
  - Restrict advertising
- Implement Restorative approaches to tobacco infractions in schools; [secondchancetobacco.org](https://secondchancetobacco.org)
- Engage Youth: support Access After School; the Buddy Program, YouthZone
- Complete and distribute Anti-Vaping and Student Resilience video

# What are area municipalities and Garfield County doing?

|                  | T-21 | TRL | Price Increase | Flavor Ban |
|------------------|------|-----|----------------|------------|
| Garfield County  | x    |     |                |            |
| Aspen            | X    | X   | X              | X          |
| Basalt           | X    | X   | X              |            |
| Carbondale       | x    | x   | x              | x          |
| Glenwood Springs | x    | x   | x              | x          |
| New Castle       | x    |     | x              |            |
| Silt             | x    |     |                |            |
| Rifle            | x    |     |                |            |
| Parachute        | x    |     |                |            |



# On the Home Front - A Trusted Adult

#1 Factor in reducing adolescent smoking - having and turning to a trusted adult.

- Parent
- Teacher
- Coach
- Mentor, youth mentor among others
- An older friend

# What about about breaking the habit?

Vaping



Get Help Quitting



Protect Our  
Community



**Get Help Quitting** - visit *MyLife MyQuit*

- CO QuitLine services are **free and confidential**.
- Services can be accessed by **calling, texting or their online platform**.
- CO QuitLine can send you up to **3 months of nicotine replacement therapy for free**
- For Young People - Access by anyone **12 years old or older without parental consent**.
- QuitLine services are available in English or **en Espanol** - Llame al 1-855-DÉJELO-YA (1-855-335-3569) o Inscríbese ahora.

# What Are Our Next Steps

## **Support Schools - Glenwood and Public Health**

- [Second Chance](#) - non-punitive intervention for first-time tobacco infractions
- Partner with Youth Zone to improve school response to students with substance issues
- [My Life, My Quit](#) - cessation - coquitline.org
- Distribute Anti-Vaping, Student Resilience video

## **Support Youth-Serving Organizations - Glenwood Springs**

- Buddy Program
- Access After School, among others

## **Support School-based resources - Glenwood Springs**

- Mental Health Clinicians, The Hope Center
- School Resource Officers

## **Support Retail Compliance of City Ordinances - Council Consideration**

## **ORDINANCE NO. 21**

Series of 2019

**AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ESTABLISHING LICENSING REQUIREMENTS FOR THE RETAIL SALE OF TOBACCO PRODUCTS, RAISING THE MINIMUM AGE OF TOBACCO PRODUCT PURCHASE TO TWENTY-ONE YEARS OF AGE, FURTHER REGULATING THE SALE OF TOBACCO PRODUCTS, AND AMENDING TITLES 050 AND 120 OF THE GLENWOOD SPRINGS MUNICIPAL CODE.**

**WHEREAS**, the City of Glenwood Springs (“Glenwood Springs” or the “City”) is a home-rule municipality organized under Article XX of the Colorado Constitution and with the authority of the Glenwood Springs Home Rule Charter; and

**WHEREAS**, tobacco use in the U.S. has declined substantially since the Surgeon General’s 1964 report, from 42 percent smoking to now about 14 percent for adults; and

**WHEREAS**, despite such declines, tobacco use remains one of the greatest public health challenges in the United States where almost 500,000 Americans still die prematurely each year from diseases related to cigarette smoking, comprising 85 percent of lung cancer deaths, which in Colorado is the number one cause of preventable death and accounts for 5,100 deaths per year; and

**WHEREAS**, it is estimated that smoking directly causes \$1.89 billion in annual health care costs in Colorado; and

**WHEREAS**, 90% of adult smokers started smoking before the age of 18 and each day more than 3,000 adolescents in the U.S. try their first cigarette; and

**WHEREAS**, youth use of electronic cigarettes (e-cigarettes), flavored tobacco, and similar products – many of which are procured by internet sales – is associated with future cigarette use; and

**WHEREAS**, the Centers for Disease Control and Prevention reports that there were 1.5 million more current youth e-cigarette users and 38.3 percent more tobacco use among high school students in 2018 than 2017; and

**WHEREAS**, research shows that youths acquire tobacco products from their peers and that 90% of the “social sources” (friends and family) of tobacco for 12-18 year old users are 18-21 year old persons; and

**WHEREAS**, research shows that youth typically do not make the additional effort to travel to neighboring localities to acquire tobacco when if the age to purchase tobacco has increased to 21 in their locality; and

**WHEREAS**, over 225 U.S. local governments and the states of California and Hawaii have enacted into law regulations prohibiting the sale of tobacco products to individuals under the age of 21 and research has shown such regulations are effective in decreasing high school tobacco use by up to 50%; and

**WHEREAS**, in 2019 the Colorado General Assembly enacted House Bill 19-1033 which removed restrictions and penalties on local government regulation of tobacco products; and

**WHEREAS**, City Council finds and declares that the amendments to the Municipal Code regarding the tobacco retail licensing requirements, raising the minimum tobacco purchase age, prohibitions on flavored tobacco and internet sales set forth herein are proper in light of the needs and desires of the City and in the promotion of the public health, safety and welfare of the City's residents and visitors.

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ORDAINS:**

**Section 1.** The foregoing recitals are incorporated herein as if set forth in full.

**Section 2.** A new Article 110 of Title 050 of the Glenwood Springs Municipal Code is hereby adopted as set forth in **Exhibit A** attached hereto.

**Section 3.** Title 120 is hereby amended as set forth in **Exhibit B** attached hereto.

**Section 4.** The Code Amendments contained herein by Exhibits A and B shall become effective as follows:

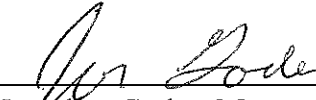
- (a) 050.110.030 Minimum Legal Sales Age, 050.110.050(b), and all changes contained in Exhibit B shall take effect September 15, 2019.
- (b) The prohibition of the Sale of Flavored Tobacco Products as defined in 050.110.020 shall take effect October 15, 2019.
- (c) The provisions of 050.110.040 through 050.110.140 shall take effect January 1, 2020 unless otherwise specified above.
- (d) All other provisions shall take effect in accordance with the Charter.

**Section 5.** The Code amendments contained herein by Exhibits A and B shall become effective in accordance with the City Charter ten days after publication.

INTRODUCED, READ ON FIRST READING, PASSED AND ORDERED  
PUBLISHED BY TITLE ONLY THIS 1<sup>ST</sup> DAY OF AUGUST 2019.



CITY OF GLENWOOD SPRINGS, COLORADO

  
Jonathan Godes, Mayor

ATTEST:

  
Catherine Mythen Fletcher, City Clerk

INTRODUCED, READ ON SECOND READING, AND ORDERED PUBLISHED BY  
TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND  
PUBLICATION THIS 15<sup>TH</sup> DAY OF AUGUST 2019.



CITY OF GLENWOOD SPRINGS, COLORADO

  
Jonathan Godes, Mayor

ATTEST:

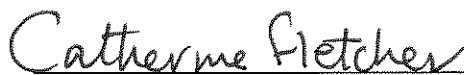
  
Catherine Mythen Fletcher, City Clerk

Exhibit A

**ARTICLE 050.110 - TOBACCO PRODUCT RETAIL LICENSE**

050.110.010. - Purpose and Applicability.

- (a) The purpose of this Article is to establish License requirements for Tobacco Product and Tobacco Paraphernalia Retailers and to set forth the requirements for the sale of Tobacco Products and Tobacco Paraphernalia to persons under twenty one years of age to protect the health, safety and welfare of individuals in the City, to encourage responsible Tobacco and Tobacco Paraphernalia retailing and to reduce illegal sales of said products in Glenwood Springs, Colorado.
- (b) This Article applies to Tobacco Product and Tobacco Paraphernalia Retailers, as defined herein

050.110.020. - Definitions.

The following words and phrases, as used in this Article, shall have the following meanings:

**Accessory** means any product that is intended or reasonably expected to be used with or for the human consumption of a Tobacco Product; does not contain tobacco and is not made or derived from tobacco; and meets either of the following: (1) is not intended or reasonably expected to affect or alter the performance, composition, Constituents, or characteristics of a Tobacco Product; or (2) is intended or reasonably expected to affect or maintain the performance, composition, Constituents, or characteristics of a Tobacco Product but (a) solely controls moisture and/or temperature of a stored Tobacco Product; or (b) solely provides an external heat source to initiate but not maintain combustion of a Tobacco Product. Accessory includes, but is not limited to, carrying cases, lanyards and holsters.

**Adult-Only Establishment** means a facility where the operator ensures or has a reasonable basis to believe, such as by checking the identification of any person appearing to be under the age of thirty (30), that no person under the Legal Age is permitted entrance.

**Characterizing Flavor** means a Distinguishable taste or aroma or both, other than the taste or aroma of tobacco, imparted either prior to or during consumption of a Tobacco Product or any byproduct produced by the Tobacco Product. Characterizing flavors include, but are not limited to, tastes or aromas relating to any fruit, chocolate, vanilla, honey, candy, cocoa, dessert, alcoholic beverage, menthol, mint, wintergreen, herb, spice; provided, however, that a Tobacco Product shall not be determined to have a characterizing flavor solely because of the use of additives or flavorings or the provision of ingredient information. Rather, it is the presence of a Distinguishable taste or aroma or both, as described in the first sentence of this definition that constitutes a characterizing flavor.

**Cigarette** means any product that contains tobacco or nicotine, that is intended to be burned or heated under ordinary conditions of use, and consists of or contains:

- (1) any roll of tobacco wrapped in paper or in any substance not containing tobacco;

- (2) tobacco in any form that is functional in the product, which, because of its appearance, the type of tobacco used in the filler, or its packaging or labeling, is likely to be offered to, or purchased by consumers as a cigarette; or
- (3) roll of tobacco wrapped in any substance containing tobacco that, because of its appearance, the type of tobacco used in the filler, or its packaging and labeling, is likely to be offered to, or purchased by, consumers as a cigarette described in subparagraph (1)(a) above.
- (4) the term includes all "roll-your-own," i.e., any tobacco that, because of its appearance, type, packaging, or labeling, is suitable for use and likely to be offered to, or purchased by consumers as tobacco for making cigarettes.

**Component or Part** means any software or assembly of materials intended or reasonably expected:

- (1) to alter or affect the Tobacco Product's performance, composition, Constituents, or characteristics; or (2) to be used with or for the human consumption of a Tobacco Product or Electronic Smoking Device. Component or Part excludes anything that is an Accessory, and includes, but is not limited to e-liquids, cartridges, certain batteries, heating coils, programmable software and flavorings for Electronic Smoking Device.

**Distinguishable** means perceivable by either the sense of smell or taste.

**Electronic Smoking Device** means an electronic device that, when activated, emits a vapor, aerosol, fume or smoke that may be inhaled or absorbed by the user, including, but not limited to, an a-cigarette, e-cigar, e-pipe, vape pen, e-hookah and similar devices. Electronic smoking device includes any component, part, or accessory of such a device, whether or not sold separately, and includes any substance, with or without nicotine, intended to be aerosolized, vaporized or produces a fume or smoke during the use of the device intended for human consumption.

**Flavored Tobacco Product** means any Tobacco Product that imparts a Characterizing Flavor.

**Hearing Officer** means the person appointed by the City Manager.

**Licensee** means the owner or holder of a Tobacco Product Retailer License.

**License** refers to the Tobacco Product Retailer license.

**Licensing Administrator** means the person(s) within the City government designated with responsibilities by the City Manager for license issuance, renewal and collection of fees.

**Minimum Legal Sales Age** means twenty-one (21) years of age or older.

**Mobile Vending** means any sales other than at a fixed location.

**Person** means natural person, a joint venture, joint-stock company, partnership, association, firm, club, company, corporation, business, trust or organization, or the manager, lessee, agent, servant, officer or employee of any of them.

**Self-Service Display** means the open display or storage of Tobacco Products in a manner that is physically accessible in any way to the general public without the assistance of the retailer or employee of the retailer and a direct person-to-person



transfer between the purchaser and the retailer or employee of the retailer. A vending machine is a form of self- service display.

**Tobacco Paraphernalia** means any item designed for the consumption, use or preparation of Tobacco Products.

**Tobacco Product** means 1) any product which contains, is made or derived from tobacco or used to deliver nicotine or other substances intended for human consumption, whether heated, chewed, absorbed, dissolved, inhaled, snorted, sniffed or ingested by any other means, including, but not limited to Cigarettes, cigars, little cigars, chewing tobacco, pipe tobacco, snuff, bidis, snus, mints, hand gels; or 2) electronic smoking device. Notwithstanding any provision of subsections 1) and 2) to the contrary, "tobacco product" includes any component, part, accessory or associated tobacco paraphernalia of a tobacco product whether or not sold separately. The term "Tobacco Product" does not include: (i) any product that contains marijuana; or (ii) any product made from or derived from tobacco and approved by the Food and Drug Administration (FDA) for use in connection with cessation of smoking.

**Tobacco Product Retail Location or Retail Location** means any premises where Tobacco Products are sold or distributed to a consumer including, but not limited to, hookah bar, lounge or cafe, any grounds occupied by a retailer, any store, stand, outlet, vehicle, cart, location, vending machine or structure where Tobacco Products are sold.

**Tobacco Product Retailer** means any Person who sells, offers for sale, or does or offers to exchange for any form of consideration, Tobacco Products, or Tobacco Paraphernalia. "Tobacco Retailing" shall mean the doing of any of these things. This definition is without regard to the quantity of Tobacco Products or Tobacco Paraphernalia sold, offered for sale, exchanged, or offered for exchange.

**Tobacco Product Retailing** means the selling, offering for sale, or exchanging for any form of consideration a Tobacco Product, including internet or e-commerce sale or delivery.

**Vending Machine** shall mean any mechanical, electrical, or electronic self-service device which, upon insertion of money, tokens, or any other form of payment dispenses product.

050.110.030. - Minimum legal sales age.

Tobacco Products shall not be sold to any person younger than the Minimum Legal Sales Age.

050.110.040. – License required.

- (a) On or after Jan 1, 2020, it shall be unlawful for any person to act as a Tobacco Product Retailer in the City unless he or she has obtained a License and maintains the same in full force and effect pursuant to this Article for each location where Tobacco Product Retailing occurs.
- (b) No license shall be issued to authorize Tobacco Product retailing anywhere other than at a fixed location within the City that is designated in the License application and approved by the Licensing Administrator. Tobacco Product Retailing by persons on foot, from vehicles, through Mobile Vending, or internet or e-commerce is prohibited.

- (c) No Licenses within 500 feet of schools. No Licenses shall be issued to retailers located within 500 feet from any public or parochial school as determined by the Licensing Administrator. This restriction shall not apply to an existing Retail Location within 500 feet of a school.
- (d) No Licenses shall be issued to applicants under the Minimum Legal Sales Age.
- (e) Tobacco Retailing without a valid License is a violation of the Article.

050.110.050. - Conditions of the Tobacco Product Retail License.

- (a) Display of License. Each License shall be prominently displayed in a publicly visible location at the licensed Tobacco Product Retail Location.
- (b) Display of Minimum Legal Sales Age Requirements. The requirement of the Minimum Legal Sale Age for the purchase of Tobacco Retail Product shall be prominently displayed in the entrance (or other clearly visible location) of the Tobacco Product Retail Location and contain at minimum the following:

WARNING  
IT IS ILLEGAL FOR ANY PERSON UNDER  
TWENTY-ONE YEARS OF AGE TO PURCHASE  
CIGARETTES AND TOBACCO PRODUCTS  
AND, UPON CONVICTION, A FINE  
MAY BE IMPOSED.

- (c) Locations. A Tobacco Product Retail Location may only have one active License at one time. Every License is separate and distinct and specific to a designated location.
- (d) Minimum age for persons handling Tobacco Products. No Person who is younger than the Minimum Legal Sales Age shall, while employed at a Tobacco Product Retail Location, sell, stock, retrieve, or otherwise handle Tobacco Products or Tobacco Paraphernalia.
- (e) Prohibition of Self-Service Displays. Licensees shall stock and display all Tobacco Products and Tobacco Paraphernalia in a manner so as to make all such products inaccessible to customers without the assistance of a retail clerk, thereby requiring a direct face-to-face exchange of the Tobacco Product or Tobacco Paraphernalia from an employee of the business to the customer except in an Adult-Only Establishment.
- (f) Prohibition on Flavored Tobacco Sales. Licensees shall not sell, offer for sale or possess with the intent to sell any Flavored Tobacco Product(s).
- (g) Requirements of positive identification. No person engaged in Tobacco Product Retailing shall sell or transfer a Tobacco Product or Tobacco Paraphernalia to another person who appears to be under the age of forty (40) years without first examining the identification of the recipient to confirm that the recipient is at least the Minimum Legal Sales Age.

050.110.060. - Application procedure.

- (a) An application for a License shall be submitted and signed by an individual authorized by the person or entity making application for the License. It is the responsibility of each applicant and/or Licensee to be informed regarding all laws applicable to tobacco retailing, including those laws affecting the issuance of said License. No applicant and/or Licensee may rely on the issuance of a License as a determination by the City that the proprietor has complied with all applicable tobacco retailing laws.
- (b) All applications shall be submitted on a form supplied by the Licensing Administrator.
- (c) A licensed Tobacco Product Retailer shall inform the Licensing Administrator in writing of any change in the information submitted on an application for a License within thirty (30) business days of a change.
- (d) All License applications shall be accompanied by the payment in full of all fees as required.

050.110.070. Issuance of a Tobacco Product License.

Upon the receipt of a completed application for a License as required by this Article, the Licensing Administrator shall sign and issue a License within thirty (30) days which period may be extended by the Licensing Administrator for good cause unless substantial evidence demonstrates that one or more of the following bases for denial exists:

- (a) The information presented in the application is incomplete, inaccurate, or false;
- (b) The applicant seeks authorization for a License at a location where this Article prohibits the issuance of a License;
- (c) The applicant seeks a License for a location that is not appropriately zoned for the use;
- (d) The applicant seeks authorization for a License and the applicant's current License is suspended or revoked;
- (e) The applicant is not qualified to hold the requested License under the provisions of this Article;
- (f) The applicant and/or retail location is not in compliance with all City, state or federal laws;
- (g) The applicant is indebted to, or obligated in any manner to the City for unpaid taxes, liens or other monies; or
- (h) The payment of the licensing fee in the full amount chargeable for such License does not accompany such License application.

050.110.080. - Denial of Tobacco Product License.

- (a) If the Licensing Administrator denies the issuance of the License, the Licensing Administrator shall notify the applicant in writing by regular mail postage prepaid on the address shown in the application. The notice shall include the grounds for denial. Notice is deemed to have been properly given upon mailing.
- (b) An applicant has the right to appeal the Licensing Administrator's denial of an application to the Hearing Officer that shall be appointed by the City Manager. Such an

appeal shall be initiated by filing a written request with the Licensing Administrator within twenty (20) days of the date of the notice of denial of the issuance of a License.

- (c) The applicant's failure to timely appeal the decision of the Licensing Administrator is a waiver of the applicant's right to contest the denial of the issuance of the License.
- (d) The appeal, including any right to further appeals, shall be conducted and controlled by the provisions of Rule 106(a)(4) of the Colorado Rules of Civil Procedure. The standard of proof at such appeal shall be a preponderance of the evidence and the burden of proof shall be upon the applicant. The Licensee's failure to timely appeal the decision is a waiver of the Licensee's right to contest the suspension or revocation of the License.

050.110.090. - License term, renewal and expiration.

- (a) Term. All Licenses issued under this Code shall be for the period of one (1) year.
- (b) Renewal of License. A Licensee shall apply for the renewal of the License and submit the renewal License fee no later than thirty (30) days prior to expiration of the existing term. The Licensing Administrator shall renew the License prior to the end of the term, provided that the renewal application and fee were timely submitted and the Licensing Administrator is not aware of any fact that would have prevented issuance of the original License or issuance of the renewal.
- (c) Expiration of License. A License that is not timely renewed shall expire at the end of its term. The failure to timely obtain a renewal of a License requires submission of a new application. There shall be no sale of any Tobacco Products after the License expiration date and before the new License is issued.

050.110.100. - License non-transferable.

- (a) A License shall not be transferred from one (1) person to another or from one location to another.
- (b) When a License has been issued to a husband and wife, or to general or limited partners, the death of a spouse or partner shall not require the surviving spouse or partner to obtain a new License for the remainder of the term of that License. All rights and privileges granted under the original License shall continue in full force and effect as to such survivors for the balance of the term of the License.

050.110.110. - Compliance monitoring.

- (a) Compliance monitoring of this Article shall be by the Glenwood Springs Police Department, as the Glenwood Springs Police Department (or designee) deems appropriate.
- (b) The Glenwood Springs Police Department shall have discretion to consider previous compliance check history or prior violations of a Licensee in determining how frequently to conduct compliance checks of the Licensee with respect to individual Licensees.

- (c) The Glenwood Springs Police Department shall inspect each Tobacco Product Retailer at least two (2) times per twelve (12) month period. Nothing in this paragraph shall create a right of action in any Licensee or other Person against the City or its agents.
- (d) Compliance checks shall be conducted as the Glenwood Springs Police Department deems appropriate, including the use of decoys, so as to allow the Glenwood Springs Police Department to determine, at a minimum, if the Tobacco Product Retailer is conducting business in a manner that complies with laws regulating access to Tobacco Products. When the Glenwood Springs Police Department deems appropriate, the compliance checks shall determine compliance with other laws applicable to Tobacco Products.

050.110.130. Suspension or Revocation of License.

- (a) The following shall be grounds for suspension or revocation of the Licensee's License:
  - (1) A violation by a Licensee or Licensee's officers, agents, or employees of any of the provisions of this Article, or any laws of the United States, the State of Colorado or ordinances of the City relating to the sale or furnishing of Tobacco Products or Cigarettes to minors, or the storage or display of Cigarettes or Tobacco Products.
  - (2) Violations of any conditions imposed by the Licensing Administrator or Hearing Officer in connection with the issuance or renewal of a License.
  - (3) Failure to pay State or local taxes that are related to the operation of the business associated with the License.
  - (4) Loss of right to possession of the licensed premises.
  - (5) Fraud, misrepresentation, or a false statement of material fact contained in the original or renewal license application;
- (b) The City Manager shall appoint a Hearing Officer to hear all actions relating to the suspension or revocation of Licenses pursuant to this Article. The Hearing Officer shall have the authority to suspend, revoke, or impose remedial sanctions for violations.
- (c) The Licensing Administrator shall commence suspension or revocation proceedings by petitioning the Hearings Officer to issue an order to the Licensee to show cause why the Licensee's License(s) should not be suspended or revoked. The Hearing Officer shall issue such an order to show cause if the petition demonstrates that probable cause exists to determine that one or more grounds exist pursuant to subsection (a) to suspend or revoke the Licensee's License. The order to show cause shall set the matter for a public hearing before the Hearing Officer.
- (d) Notice of the order to show cause order and hearing date shall be mailed to Licensee by regular mail, postage prepaid, at the address shown on the License no later than thirty (30) days prior to the hearing date. Notice is deemed to have been properly given upon mailing.
- (e) In determining whether a License should be suspended or revoked, and in determining whether to impose conditions in the event of a suspension, the Hearing Officer shall consider the following factors:
  - (1) The nature and circumstances of the violation;
  - (2) Corrective action, if any taken by the Licensee;

- (3) Prior violations, if any by the Licensee;
- (4) The likelihood of recurrence of the violation;
- (5) Whether the violation was willful; and
- (6) Previous sanctions, if any, imposed on the Licensee.

050.110.140. Penalty.

It shall be unlawful for any person or business to violate a provision of this Article.

Violators shall be subject to the penalties provided in Section 010.020.080 of this Code and may be subject to any civil remedies available. A separate offense shall be deemed committed upon each day such business or person is in violation of this article.

050.110.150 - Effective date.

This Article shall become effective as of January 1, 2020 and enforceable on and after that date. Any Tobacco Product Retailer without a License after the effective date will be in violation of this Article.

## Exhibit B

New language is double underlined

~~Strike-through language is deleted~~

120.030.092 - Possession of tobacco products by minor underage persons and furnishing or selling cigarettes or tobacco products to minors underage persons prohibited.

- (a) ~~Except as provided in Subsection (f) below, a~~Any person who knowingly furnishes to any person who is under twenty-one (21) ~~eighteen (18)~~ years of age, by gift, sale or any other means, any cigarettes or tobacco products, commits a misdemeanor; and, upon conviction thereof, shall be punished as set forth in Section 010.020.080. It shall be an affirmative defense to a prosecution under this section that the person furnishing the tobacco product was presented and reasonably relied upon a document which identified the person receiving the tobacco product as being twenty-one (21) ~~eighteen (18)~~ years of age or older.
- (b) Any person who is under twenty-one (21) ~~eighteen (18)~~ years of age and who possesses, purchases, ~~or acquires, or attempts to purchase~~ any cigarettes or tobacco products commits a misdemeanor; and, upon conviction thereof, shall be punished as set forth in Section 010.020.080, or the court shall allow such person to perform community service and be granted credit against the fine and court costs.
- (c) For purposes of this section, the term tobacco product has the same meaning as set forth in section 050.110.020, ~~means any product that contains nicotine or tobacco or is derived from tobacco and is intended to be ingested or inhaled by or applied to the skin of an individual or any electronic device that can be used to deliver nicotine to the person inhaling from the device, including but not limited to an electronic cigarette, cigars, cigarillo or pipe.~~
- (d) Any person who sells or offers to sell any cigarettes or tobacco products, as defined above, over the counter or by use of a vending machine or other coin-operated machine commits a misdemeanor; and, upon conviction thereof, shall be punished as set forth in Section 010.020.080; except that ~~cigarettes~~ tobacco products may be sold at retail as permitted by Title 050, Article 120 of this Code ~~through vending machines only in:~~
  - (1) ~~Factories, businesses, offices or other places not open to the general public;~~
  - (2) ~~Places to which persons under the age of eighteen (18) years are not permitted access; or~~
  - (3) ~~Places where the vending machine is under the direct supervision of the owner of the establishment or an adult employee of the owner, including but not limited to, establishments holding a valid liquor license issued pursuant to C.R.S. Article 47 of Title 12. As used in this section, under direct supervision means the vending machine shall be in plain vision of the employee or owner during regular business hours.~~

~~It shall be an affirmative defense to a prosecution under this subsection that the person selling or offering to sell the tobacco product was presented with and reasonably relied upon a document which identified the person purchasing the tobacco product as being eighteen (18) years of age or older.~~

- (e) ~~Any person who sells or offers to sell any cigarettes or tobacco products shall display a warning sign as specified in this subsection. Any person who fails to display said warning sign commits a misdemeanor and, upon conviction thereof, shall be punished as set forth in Section 010.020.080. Said warning sign shall be displayed in a prominent place in the building and on such machine at all times and shall have a minimum height of three (3) inches and a width of six (6) inches, and shall read as follows:~~

~~WARNING  
IT IS ILLEGAL FOR ANY PERSON UNDER  
EIGHTEEN YEARS OF AGE TO PURCHASE  
CIGARETTES AND TOBACCO PRODUCTS  
AND, UPON CONVICTION, A FINE  
MAY BE IMPOSED.~~

~~Any violation of the provisions of this subsection shall not constitute a violation of any other provisions of this section.~~

- (f) ~~It shall be an affirmative defense to the offense described in Subsection (b) above that the cigarettes or tobacco products were possessed or consumed by a person under eighteen (18) years of age under the following circumstances:~~
- (1) ~~While such person was legally upon private property with the knowledge and consent of the owner or legal possessor of such private property and the cigarettes or tobacco products were possessed with the consent of his/her parent or legal guardian who was present during such possession.~~
- (2) ~~For purposes of this subsection, private property shall mean any dwelling and its curtilage which is being used by a natural person or natural persons for habitation and which is not open to the public and privately real property which is not open to the public. Private property shall not include:~~
- a. ~~Any establishment which sells cigarettes or tobacco products or upon which cigarettes or tobacco products are sold; or~~
- b. ~~Any establishment which leases, rents or provides accommodations to members of the public generally.~~



**ORDINANCE NO. 26**

Series of 2019

**AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, AMENDING TITLE 050 OF THE GLENWOOD SPRINGS MUNICIPAL CODE TO PERMIT PERSONS EIGHTEEN YEARS OF AGE AND OLDER TO HANDLE TOBACCO PRODUCTS IN THE COURSE OF EMPLOYMENT.**

**WHEREAS**, the City of Glenwood Springs (“Glenwood Springs” or the “City”) is a home-rule municipality organized under Article XX of the Colorado Constitution and with the authority of the Glenwood Springs Home Rule Charter; and

**WHEREAS**, by Ordinance No. 21, Series 2019 the City Council raised the minimum legal age to purchase and possess tobacco products from eighteen to twenty-one; and

**WHEREAS**, the Colorado State Liquor Code, C.R.S. § 44-3-901 and 1 C.C.R 203-2 permits employees older than eighteen and under the age of twenty-one to hold employment in most liquor-licensed establishments; and

**WHEREAS**, in order to remove conflicting barriers to employment, the City wishes to conform its tobacco licensing code with the state liquor code as it relates to age of individuals employed in licensed establishments; and

**WHEREAS**, City Council finds and declares that the amendment to the Municipal Code regarding the age of individuals employed in tobacco licensed retailers is proper in light of the needs and desires of the City and in the promotion of the public health, safety and welfare of the City’s residents and visitors.

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ORDAINS:**

**Section 1.** The foregoing recitals are incorporated herein as if set forth in full.

**Section 2.** Section 010.110.050 of the Municipal Code is hereby amended as follows, with double underlined text added and strike through language deleted:

050.110.050. - Conditions of the Tobacco Product Retail License.

\*\*\*

(d) Minimum age for persons handling Tobacco Products. No Person who is younger than the Minimum Legal Sales Age eighteen (18) years of age shall, while employed at a

Tobacco Product Retail Location, sell, stock, retrieve, or otherwise handle Tobacco Products or Tobacco Paraphernalia.

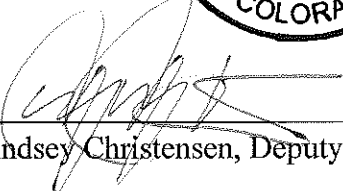
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**Section 3.** The Code amendment contained herein shall become effective in accordance with the City Charter ten days after publication.

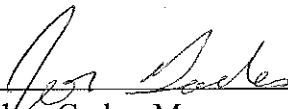
INTRODUCED, READ ON FIRST READING, PASSED AND ORDERED  
PUBLISHED BY TITLE ONLY THIS 19<sup>TH</sup> DAY OF SEPTEMBER 2019.



ATTEST:

  
Lindsey Christensen, Deputy City Clerk

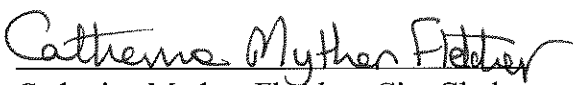
CITY OF GLENWOOD SPRINGS, COLORADO

  
Jonathan Godes, Mayor

INTRODUCED, READ ON SECOND READING, AND ORDERED PUBLISHED BY  
TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND  
PUBLICATION THIS 3<sup>RD</sup> DAY OF OCTOBER 2019.



ATTEST:

  
Catherine Mythen Fletcher, City Clerk

CITY OF GLENWOOD SPRINGS, COLORADO

  
Jonathan Godes, Mayor

**RESOLUTION 2019 - 34**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY  
OF GLENWOOD SPRINGS, COLORADO, ADOPTING A  
FEE FOR A TOBACCO PRODUCT RETAIL LICENSE.**

**WHEREAS**, tobacco use remains one of the greatest public health challenges in the United States where almost 500,000 Americans still die prematurely each year from diseases related to cigarette smoking, comprising 85 percent of lung cancer deaths, which in Colorado is the number one cause of preventable death and accounts for 5,100 deaths per year; and

**WHEREAS**, on August 15, 2019 through Ordinance 21, Series of 2019, City Council established licensing requirements for the retail sale of tobacco products; and

**WHEREAS**, City Council has amended to the Municipal Code regarding the tobacco retail licensing requirements in light of the needs and desires of the City and in the promotion of the public health, safety and welfare of the City's residents and visitors; and

**WHEREAS**, City Council now wishes to establish a fee for licenses for the retail sale of tobacco products in the City of Glenwood Springs.

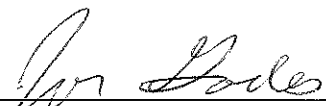
**NOW, THEREFORE, IT IS RESOLVED BY THE CITY COUNCIL OF THE CITY  
OF GLENWOOD SPRINGS, COLORADO, THAT:**

**Section 1.** The above recitals are hereby incorporated as findings by the City Council of the City of Glenwood Springs.

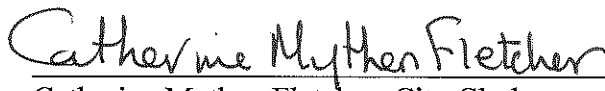
**Section 2.** The City Council of the City of Glenwood Springs finds that all license applications shall be accompanied by the payment in full of a licensing fee of one thousand dollars (\$1,000).

INTRODUCED, READ, AND PASSED THIS 5<sup>TH</sup> DAY OF SEPTEMBER 2019.

CITY OF GLENWOOD SPRINGS, COLORADO

  
\_\_\_\_\_  
Jonathan Godes, Mayor

ATTEST:

  
\_\_\_\_\_  
Catherine Mythen Fletcher, City Clerk





**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Ordinance 2025-05; Budget Amendment #2 (One Reading)                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Action Requested:</b>     | Approval of budget amendment to appropriate reserves for the purpose of opposing Rocky Mountain Industrial's (RMI) ongoing efforts to exponentially expand its mining operation next to the City of Glenwood Springs.                                                                                                                                                                                                                                                                                              |
| <b>Department:</b>           | City Administration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Presented By:</b>         | Steve Boyd, Karl Hanlon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Strategic Goals:</b>      | Protect and Preserve our Quality of Life                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Background Info:</b>      | Rocky Mountain Industrials operates a relatively small mining operation next to town. While the City is not opposed to that continuing, its ongoing efforts to greatly increase the area impacted and amount of product mined is a continuing threat to the quality of life of our residents. While the City is fortunate to have the strong support of nearly every regional resident, agency and elected official, the company's persistence is forcing us to maintain this battle as our highest City priority. |
| <b>Issues:</b>               | We have reason to believe that this company will appeal recent judicial rulings that impair or eliminate their ability to pull hundreds of thousands of tons of gravel from Iron Mountain, which is widely and passionately opposed by City residents.                                                                                                                                                                                                                                                             |
| <b>Fiscal Impact:</b>        | The requested appropriation for legal and related fees in 2025 is \$1,000,000 to the MINE OPPOSITION line item in the General Fund. This is to directly confront legal potential legal challenges by hiring specialized legal and lobbying firms to represent our interests. The funds come from the Available Reserve, we will continue to carry the existing \$1,000,000 reserve to oppose this expansion also.                                                                                                  |
| <b>Legal Review:</b>         | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Staff Recommendation:</b> | Staff believes we need to expend whatever resources are necessary to prevent the proposed expansion of the mine in our City.                                                                                                                                                                                                                                                                                                                                                                                       |

**ORDINANCE NO. 05**

Series of 2025

**AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS,  
COLORADO, AMENDING THE 2025 APPROPRIATION ORDINANCE  
TO REFLECT CARRYOVERS FROM THE 2024 BUDGET,  
REALLOCATION OF FUNDS, AND EXPENDITURES APPROVED  
AFTER SUBMISSION OF THE 2025 BUDGET.**

INTRODUCED, READ, PASSED, AND ORDERED PUBLISHED BY TITLE ONLY  
THIS 6<sup>th</sup> DAY OF FEBRUARY, 2025.

CITY OF GLENWOOD SPRINGS, COLORADO

ATTEST:

\_\_\_\_\_  
Ingrid Wussow, Mayor

\_\_\_\_\_  
Ryan Muse, City Clerk

**Exhibit A**

**Ordinance 2025-05 Budget Amendment #2**

| <b>Fund</b>    | <b>Org</b> | <b>Object</b> | <b>Increase</b> | <b>Decrease</b> | <b>Description</b> | <b>Account</b>   |
|----------------|------------|---------------|-----------------|-----------------|--------------------|------------------|
| <u>General</u> |            |               |                 |                 |                    |                  |
| 01             | 01120      | 52845         | \$1,000,000     |                 | Mine Opposition    | Non-Departmental |



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Planning File 21-24; Roaring Fork Transportation Authority 1041 Review

**Action Requested:** Consideration of approval of a 1041 Review for the Roaring Fork Transit Authority (RFTA) to construct a new transit center.

**Department:** Economic and Community Development

**Presented By:** Watkins Fulk-Gray

**Strategic Goals:** Generate Sustainable Economic Development  
Preserve and Improve Infrastructure

**Background Info:** This project involves the construction of a new, expanded transit center, a new administration building, and a new maintenance building that is proposed on RFTA-owned parcels in the immediate vicinity of existing RFTA buildings. These three elements are referred to by RFTA as Phase 6A (the transit center), Phase 6B (the administration building), and Phase 8 (the maintenance building). The administration building and maintenance building were part of the Location & Extent application and were approved unanimously by the Planning and Zoning Commission (P&Z) on January 28th. Phase 6A, the new and expanded transit center, is subject to 1041 Review by City Council. The new transit center will be a significant upgrade from the current transit stop, and will include nine bus bays, overhead electric bus chargers, a building serving as a rider shelter and other uses, and expanded parking. Together with RFTA's other facilities nearby, this will help establish Glenwood as RFTA's operations.

Process

The interlocking of approval processes and of overlapping sets of regulations is a notable feature of this project. The approval process for the transit center is broken down by "essential elements" of the transit center and "non-essential elements." The essential elements of the transit center use, such as the station platform and nearby intersections, are subject to approval by City Council using Article 070.080, Guidelines and Regulations for Matters of State Interest. "Non-essential" elements of the transit center project like landscaping and parking lot design, which do not substantially impact the 1041 criteria analysis, are approved by P&Z through Location & Extent Review, using standards from the Glenwood Meadows Zoning and Development Plan (GMZDP) (except for instances on which the GMZDP is silent, in which case the City's typical code standards apply). The standards City Council must use to approve the 1041 Review will be discussed below in the section "1041 Criteria."

As stated already, the P&Z approved the administration building, maintenance building, and the "non-essential" elements of the transit center by approving the Location & Extent Review. The standards P&Z used to review the non-essential elements of the transit center, the administration building, and the maintenance building are the City's typical code standards, except that subsection 070.040.020, Sensitive Area Protection standards, replaces many of the usual design standards due to the project being in a mapped geohazard zone.

Planning and Zoning Commission

The P&Z considered the 1041 Review and Location & Extent Review on December 17th. At that meeting questions arose regarding the Glenwood Meadows Annexation and Development Agreement applicability and timelines. Staff also flagged that the traffic study provided by the applicant needed updating. The P&Z therefore continued the item to its January 28th meeting. In the intervening time between the December and January P&Z meetings, the traffic report was updated and accepted by Staff and the questions about the Annexation and Development Agreement resolved.

The P&Z's discussions about both 1041 Review and Location & Extent Review mostly related to parking lot lighting, parking lot landscaping, the improvement of Wulfsohn Road, and intersection improvements to the Wulfsohn/Midland intersection. As shown by their unanimous recommendation, P&Z ultimately was satisfied that the lighting levels will be adjusted appropriately, additional parking lot landscaping is not feasible given the

soil conditions, Wulfsohn Road will be appropriately reconstructed where it is torn up, and that the intersection contribution requirement is adequate.

The approved minutes from the December 17th P&Z meeting and the draft minutes for the January 28th meeting are attached to the packet, along with a complete analysis of both the 1041 Review and Location & Extent Review in the December 17th staff packet. The January 28th staff memo mostly contains updates about questions and issues that came up on December 17th.

#### 1041 Criteria

1041 Reviews involve 19 review criteria found in Article 070.080, along with three criteria specific to "key facilities." Each of the 22 review criteria are reproduced below, and inset with **bold** text is Staff's analysis of how the project fits the criteria.

1. The health, welfare, and safety of the residents of this City will be protected and served.

**Staff believes that with the included conditions of approval, the proposed transit center development will serve and improve the health, safety, and welfare of residents.**

2. The project is in general conformance with the Comprehensive Plan and other duly adopted plans and permit criteria.

**The proposed transit center is in general conformity with the Comprehensive Plan, supporting goals, policies, and actions such as:**

- a. **Promote transit-oriented development**
- b. **Expand local transit and enhance regional transit to, from, and through Glenwood Springs**
- c. **Support the expansion of green transportation options**
- d. **Plan for transit stations located in all mixed-use neighborhoods by incorporating principles of smart growth, new urbanism and green building**
- e. **Concentrate growth in Glenwood Springs in locations that can be served by high-frequency transit**

3. The project is financially feasible. The determination of financial feasibility of the project may include but is not limited to the following considerations:

- a. The business plan submitted by the applicant.
- b. Relevant bond issue, loan and other financing approval or certifications (ex: approved bond issue; bond counsel opinion).

**The applicant organization, RFTA, has provided evidence that they have a diverse and substantial set of funding sources to make the project feasible.**

4. The project is not subject to significant risk from natural hazards. The determination of risk from natural hazards to the project may include but is not limited to the following considerations:
  - a. Faults and fissures.
  - b. Unstable slopes including landslides, rock slides, and avalanche areas.
  - c. Expansive or evaporative soils and risk of subsidence.
  - d. Wildfire hazard areas.
  - e. Floodplains.

**Geohazards—hydrocompactive soils and debris fan—do exist on this site, according to the City's geohazard mapping. The past ten years have shown that it is possible to build in the challenging geology of Glenwood Meadows, but also that buildings will fail when the conditions are not properly taken into account. Two**



**recommendations for designing the foundations are made in the geotechnical report. Conditions of approval have been recommended to ensure safety and full mitigation from geologic hazards.**

5. The project will not have a significant adverse effect on the capability of local governments affected by the project to provide local infrastructure and services, or exceed the capacity of service delivery systems. The determination of the effects on local government services and infrastructure may include but is not limited to the following considerations:
  - a. Current and projected capacity of roads, schools, infrastructure, drainage and/or stormwater infrastructure, housing, recreational facilities, emergency services, and other services necessary to accommodate development, and the impact of the project upon the current and projected capacity.
  - b. Changes caused by the project in the cost of providing education, transportation networks, water treatment and wastewater treatment, stormwater drainage, channel stabilization, recreation facilities, bridges, emergency services, or other governmental services or facilities.
  - c. Need for temporary roads to access the project for construction and maintenance.
  - d. Change in demand for public transportation.

**The project does challenge the City's electric and road infrastructures. The proposed bus and car chargers, in particular, take significant capacity from the existing substation and transformers serving the area. Ultimately, without infrastructure upgrades with the project as proposed, the City would lose redundancy that has been planned for Glenwood's grid system. However, there are infrastructure upgrades that will allow the project to proceed as proposed without detriment to the City's grid. A condition of approval has been recommended that will establish a separate process for the Electric Department to take stock of its needs and to engage with RFTA in a fair cost-sharing agreement.**

**The traffic impact study provided by the applicants makes clear that there will be significant impacts to the road system from the additional traffic the project will generate, particularly to the western Wulfsohn Road/Midland Avenue intersection, the Devereux/Midland intersection, the roundabouts at I-70's exit 114, and the 9<sup>th</sup>/Grand intersection. A closer reading of the traffic impact study reveals, in the opinion of the City's Engineering and Public Works departments, that the provided traffic impact study has flaws that need correcting, which include not providing analysis for three intersections that are important to consider and discrepancies with the traffic counts. The City's Engineering Department has determined that a roundabout is the preferred option to enhance the Wulfsohn/Midland intersection functionality and has already engaged in preliminary designs for a roundabout at this intersection. This project makes the need for intersection improvements acute. A condition of approval has been recommended requiring RFTA update its traffic impact study and pay a share of the construction costs of the roundabout.**

6. The project will not have a significant adverse effect on the quality or quantity of recreational opportunities and experience. The determination of effects of the project on recreational opportunities and experience may include but is not limited to the following considerations:
  - a. Changes to existing and projected visitor days.
  - b. Changes in quality and quantity of fisheries.
  - c. Changes in instream flows or reservoir levels.
  - d. Changes in access to recreational resources.
  - e. Changes to quality and quantity of hiking, biking, or horseback riding trails.
  - f. Changes to hunting experiences.
  - g. Changes to open space.
  - h. Changes to existing conservation easements.
  - i. Changes to regional or neighborhood parks.
  - j. Changes to recreational scenic experience.

**It is possible that the project will promote greater access to the Wulfsohn-area and Red Mountain trails through increased bus service to the site, which is located near the Wulfsohn trails. It is not believed that construction activities will interfere with trail users.**

7. The project will not significantly degrade air quality. The determination of effects of the project on air quality may include but is not limited to the following considerations:
  - a. Changes in visibility and microclimates.
  - b. Applicable air quality standards.

**The project will enable more bus traffic, but the project also programs additional electrification of RFTA's bus system. Moreover, bus traffic, by its nature, is intended to reduce overall air pollution through removing more polluting vehicles from the roadways. It is believed that the proposal will not degrade air quality.**

8. The project will not significantly degrade existing visual quality. The determination of visual effects of the project may include but is not limited to the following considerations:
  - a. Visual changes to ground cover and vegetation, waterfalls and streams, or other natural features.
  - c. Interference with viewsheds and scenic vistas.
  - d. Changes in landscape character types of unique land formations.
  - e. Compatibility of structure size and color with scenic vistas and view sheds.
  - f. Changes to open space.
  - g. Changes to existing conservation easements.
  - h. Changes to impacts to regional or neighborhood parks.

**The project will not significantly degrade the site's aesthetic qualities because the site is already developed and is surrounded by existing development.**

9. The project will not significantly degrade surface water quality. The determination of effects of the project on surface water quality may include, but is not limited to, the following considerations:
  - a. Changes to existing water quality, including patterns of water circulation, temperature, conditions of the substrate, extent and persistence of suspended particulates and clarity, odor, color or taste of water.
  - b. Applicable narrative and numeric water quality standards.
  - c. Changes in point and nonpoint source pollution loads.
  - d. Increase in erosion.
  - e. Changes in sediment loading to waterbodies.
  - f. Changes in stream channel or shoreline stability.
  - g. Changes in stormwater runoff flows.
  - h. Changes in trophic status or in eutrophication rates in lakes and reservoirs.
  - i. Changes in the capacity or functioning of streams, lakes, or reservoirs.
  - j. Changes to the topography, natural drainage patterns, soil morphology and productivity, soil erosion potential, and floodplains.
  - k. Changes to stream sedimentation, geomorphology, and channel stability.

**Surface water runoff is designed to be captured through piping and underground chamber systems after being filtered through native and drought-resistant landscaping. The drainage report and stormwater plans need to be revised so as to consider the impact on the culvert underneath Midland Avenue and not overload it, causing it to fail. This has been recommended as a condition of approval.**

10. The project will not significantly degrade groundwater quality. The determination of effects of the project on groundwater quality may include, but is not limited to, the following considerations:
  - a. Changes in aquifer recharge rates, groundwater levels and aquifer capacity including seepage losses through aquifer boundaries and at aquifer-stream interfaces.
  - b. Changes in capacity and function of wells within the impact area.
  - c. Changes in quality of well water within the impact area.

**Groundwater quality will be protected by using the same practices as protecting surface water quality, including properly sized piping and conveyances, in addition to erosion prevention measures that will be required by building or grading permits.**

11. The project will not significantly degrade wetlands and riparian areas, terrestrial or aquatic plant or animal life.

**No large-scale wetland or riparian areas exist in the project's vicinity.**

12. The project will not significantly deteriorate soils and geologic conditions. The determination of effects of the project on soils and geologic conditions may include but is not limited to the following considerations:
- a. Loss of topsoil due to wind or water forces.
  - b. Changes in soil erodibility.
  - c. Physical or chemical soil deterioration.
  - d. Terrain deformation/mass wasting/subsidence.
  - e. Compacting, sealing and crusting.
  - f. Waterlogging.
  - g. Soil morphology and productivity.

**To avoid unwanted soil and geologic conditions such as erosion and soil compaction, all recommendations from the project's geotechnical experts must be followed and the geotechnical report must support all stormwater, civil, and structural designs. Conditions of approval have been recommended ensuring that this happens.**

13. The project will not cause a nuisance. The determination of nuisance effects of the project may include, but is not limited to, the following considerations: Increase in odors, dust, fumes, glare, heat, noise, vibration or artificial light.

**Potential sources of nuisances for this project after buildout would include lighting and noise from buses. The exterior lighting standards should mitigate this situation. Noise from buses will likely exist, though the site already experiences bus traffic at the existing transit stop. It is not anticipated that noise from buses will excessively contribute to a nuisance situation, given that the nearest residential development is approximately a quarter mile away.**

14. The project will not result in an unreasonable risk of releases of hazardous materials. The determination of the risk of release of hazardous materials caused by project may include but is not limited to the following considerations:
- a. Plans for compliance with federal and state handling, storage, disposal, and transportation requirements.
  - b. Use of waste minimization techniques.
  - c. Adequacy of spill prevention and response plans.

**No risk from hazardous material releases is anticipated.**

15. Urban development, population densities, and site layout and design of storm water and sanitation systems shall be accomplished in a manner that will prevent the pollution of aquifer recharge areas. The determination of potential for pollution of the aquifer recharge areas by the project may include but is not limited to the following considerations:
- a. Proximity of urban development and population densities to aquifer recharge areas.
  - b. Proximity of stormwater and sanitation systems to aquifer recharge areas.

- c. Changes in water quality in the aquifer recharge areas.

**There are no known impacts to aquifer recharge zones.**

- 16. The project shall be reasonably necessary to meet projected community development and population demands in the areas to be served by the project, or to comply with regulatory or technological requirements. The determination of whether the project is reasonably necessary may include but is not limited to the following considerations:
  - a. Relationship to reasonable growth projections and local land use plans.
  - b. Relationship to other providers' service areas.
  - c. Whether the project is not in compliance with regulatory or technological requirements or will not be in compliance in the near future.

**The project represents an expansion of RFTA's transit service and commitment to mass transit. The transit center will expand to nine bus bays, include bus charging infrastructure, include more amenities to riders, and include significantly more parking. A significant portion of Glenwood Springs's workforce commutes from outside the city, and vehicle traffic is a primary concern within the city. This project has the potential to reduce traffic and give commuters greater opportunities to take mass transit.**

- 17. The project shall be constructed in areas which will result in the proper utilization of existing facilities or systems to ensure the orderly and sustainable development of infrastructure in the City and adjacent communities, including the following considerations:
  - a. Site selection and construction will not create or encourage growth and development which is incompatible with and cannot be accommodate by the local financial capacity of the area or residents to be served.
  - b. New systems will not overburden existing systems and current and future demand for services can be met within existing and proposed capacity.
  - c. The project will not create proliferation of special districts or overlapping of special districts with the boundaries of other special districts or municipalities.
  - d. The project is the best alternative for the provision of services to the geographical area serviced.
  - e. To the extent feasible, facilities and systems shall be consolidated with existing facilities and systems in the area.
  - f. The project will not result in duplicative services or excessive capacity.
  - g. The project will be administered so as to minimize disruption of utility services and preserve desirable existing community patterns.

**As discussed in the criterium addressing service delivery capacity, the project does represent challenges to both the road system and electric infrastructure. The site location is ideal for the expansion of transit services, but conditions of approval and separate agreements will be necessary for cost sharing of upgrades that will be needed to the road and electric systems.**

- 18. Economic impacts including, but not limited to, taxable property, licensed and permitted facilities, and recreation related to the proposed project have been identified and will be compensated for or mitigated.

**The site has previously been used for governmental entities, so no economic detriment is anticipated with the proposal.**

- 19. The project shall emphasize the most efficient use of water, including the recycling, reuse, and conservation of water, including the following considerations:
  - a. Whether the project uses readily available conservation techniques.
  - b. Whether the project recycles water to the greatest extent permissible.
  - c. Whether the project will use raw water for exterior or irrigation use if available.

The applicant team has identified that they will be using water efficient toilets and plumbing fixtures and will be using raw water for all irrigation. However, it is unclear if it will be possible to transport the raw water to the transit center site. The City's past experience with irrigation lines running underneath streets in Glenwood Meadows, as the applicants propose underneath Wulfsohn, has shown that this is a bad long-term idea and leads to street failures. A condition of approval has been recommended for the applicant to revise the plans removing the irrigation piping beneath Wulfsohn.

#### **Review Criteria Specific to Areas Around Key Facilities**

"Key facilities" are facilities related to transportation and utilities, and by definition includes mass transit stations. Article 070.080 requires the following three criteria for key facilities such as the proposed transit center:

1. The project will encourage the smooth flow of motorized and nonmotorized traffic.
2. The project will foster the development of such areas in a manner calculated to preserve the smooth flow of such traffic.
3. The project will preserve desirable existing community patterns.

**City Staff believes the project's design will have a satisfactory traffic flow internally, but without changes to the nearby Wulfsohn/Midland intersection, there will not be a smooth or safe traffic flow. City Staff has identified that a roundabout is the preferred solution to upgrade this intersection. Because RFTA will be contributing to the undesirable and unsafe condition of this intersection, the City has requested in a condition of approval that they pay a portion of the construction cost of a roundabout.**

#### **Issues:**

An important focus of this project from the City's perspective is how the project will affect the City's road systems, and particularly the Wulfsohn/Midland intersection in close proximity to the transit center. This intersection had already been flagged for needing improvements, and the Engineering Department established prior to RFTA's submitting their application that a roundabout is the preferred alternative to improve safety and the functioning of this intersection. RFTA's updated traffic report established the traffic volume increase at this intersection, and a condition of approval has been recommended that sets RFTA's required contribution toward the roundabout construction based on the traffic report.

The proposed transit center meets the Comprehensive Plan and most code requirements. As discussed previously, many elements of the transit center plan, such as parking lot design and landscaping, fall under the purview of Location & Extent Review that was approved by P&Z. For approval of the 1041 Review, Staff recommends the conditions of approval listed below. These conditions are the same as those recommended by P&Z, except as noted at the end of the list.

1. The development shall comply with the requirements of the Code. Any future physical changes or improvements to the property or buildings are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein and approved by the Community Development Director.
3. The applicant shall comply with recommendations identified in the technical reports submitted as part of the application including but not limited to geotechnical and drainage reports.
4. At the time of Final Plans Review submission, the plans shall be revised to include the following changes:
  - a. The sidewalk along Wulfsohn Rd. adjacent to the transit center parcel shall be eight feet in width.
  - b. The stormwater detention plans, civil plans, and structural plans shall be revised in consultation with the geotechnical engineer to ensure compliance with the geotechnical report. The applicant shall provide a letter from the geotechnical engineer stating that the stormwater, civil, and structural designs of the transit center comply with the recommendations of the geotechnical report.
  - c. The drainage report and corresponding stormwater plans shall be revised to consider the impacts upon the culvert underneath Midland Avenue.

5. Prior to submitting a building and/or grading permit application, the owner shall:
  - a. Submit and receive approval of a Final Plans application in accordance with Municipal Code section 070.060.050(c).
  - b. Submit an Engineer's Estimate of all public improvements and provide security for completing said improvements per requirements of the Engineering Standards.
  - c. Enter into a Development Agreement that memorializes the development approvals.
  - d. Provide all other permits from outside jurisdictions necessary for the project.
6. Prior to issuance of the building permit, the applicant shall:
  - a. Obtain Right-of-Way Encroachment Licenses for all private uses or structures to be located within the right-of-way.
7. Prior to issuance of the Certificate of Completion, owner shall provide as-built plans and an Improvement Survey Plat per the Engineering Standards.
8. RFTA shall contribute \$100,800 toward the construction of a roundabout at the west Wulfsohn/Midland intersection. These funds will be appropriated in 2025 and held in reserve by the City for a period of five years, ending March 1, 2030. Prior to March 1, 2030, the City shall have the option to extend the five-year period in writing for another five-year period which will end on March 1, 2035. Nothing shall prohibit RFTA and the City from extending the timeframe in mutual agreement beyond the 10-year timeframe prior to March 1, 2035. RFTA shall not be obligated to pay its contribution if the transit center is not constructed.
9. RFTA shall request can and will serve letters for electric service for any electric load beyond what is required to service the development as submitted in the plans. These elements included in the plans include all items on the Glenwood Springs Electric Department estimate titled "RFTA 6A & 6B" dated January 15, 2025, and included with the February 6, 2025 staff report packet. All items noted as "future" in the plans, such as future electric bus chargers, shall be subject to review by the Electric Department.
10. All repairs, encroachments and replacements to Wulfsohn Road associated with the transit center construction shall be replaced with road cross sections meeting City standards. These cross section designs, as may be amended, are shown in "Glenwood Meadows City Standard Roadway Details" along with the general locations of roadway replacement areas.
11. The applicant shall comply with and address all City referral comments prior to the issuance of a grading permit or building permit.

The conditions of approval recommended by P&Z are the same as those presented here except for these conditions:

*8. RFTA will contribute \$100,800 toward the construction of a roundabout at the west Wulfsohn/Midland intersection. These funds will be appropriated in 2025 and held in reserve by the City for a period of five years, ending March 1, 2030. Prior to March 1, 2030, the City shall have the option to extend the five-year period in writing for another five-year period which will end on March 1, 2035. Nothing shall prohibit RFTA and the City from extending the timeframe in mutual agreement beyond the 10-year timeframe prior to March 1, 2035. RFTA shall not be obligated to pay its contribution if the transit center is not constructed.*

*10. All repairs, encroachments and replacements to Wulfsohn Road associated with the transit center construction shall be replaced with road cross sections meeting City standards. These cross section designs, **as may be amended**, are shown in "Glenwood Meadows City Standard Roadway Details" along with the general locations of roadway replacement areas.*

P&Z's recommended condition #8 was replaced by this one because of negotiations between City staff and RFTA staff. The dollar amount \$100,800 is based upon an estimated cost of \$6 million for the roundabout and a proportional contribution of 1.68% identified in the traffic report as the traffic increase at this intersection resulting from the transit center project. The change shown in bold and underlined in condition #10 is recommended to allow adjustments to the technical specifications while the geotechnical report from which they are based is being updated.

**Fiscal Impact:** RFTA's projects will precipitate a need for intersection improvements at the Midland/Wulfsohn intersection, for which the Engineering Department has stated its preference of a roundabout. It is estimated that the roundabout will cost Glenwood \$6 million to construct. A recommended condition of approval establishes a contribution from RFTA for the roundabout, but this contribution is only based on the estimated traffic volume increase from the transit center, not from the administration building. The traffic report estimates the administration building will increase traffic volume 5.9% at the intersection.

The City has tried to minimize fiscal impacts to its roadways from the project by recommending a condition of approval requiring RFTA to "beef up" the roadway sections that will be subject to the harsh impacts of heavy buses turning and stopping near the transit center.

**Legal Review:** Legal has reviewed the conditions of approval and has been involved with RFTA discussions leading up to the P&Z meetings.

**Staff Recommendation:** Approve the proposed transit center with conditions of approval as proposed.

# Planning File #21-24

1041 Review for RFTA Transit Center  
2302 Wulfsohn Rd.

City Council

February 6, 2025





# Planning File #21-24 1041 Review and Location & Extent

|                       |                                                                                                                                          |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| REQUEST               | 1) 1041 Review for an expanded transit center and 2) Location & Extent Review for a new administration building and maintenance building |
| APPLICANT             | DHM                                                                                                                                      |
| OWNER                 | RFTA (Roaring Fork Transportation Authority)                                                                                             |
| ZONE                  | M <sub>1</sub> , I <sub>1</sub>                                                                                                          |
| LOCATION:             | 2307 and 2302 Wulfsohn Rd                                                                                                                |
| SURROUNDING LAND USES | North: Right-of-Way Corridor<br>South: Parkland/Open Space<br>East: Vacant<br>West: Vacant                                               |
| LOT SIZE              | 12.65 acres (per Assessor's records)                                                                                                     |



# History and Existing Conditions

## Planning & Zoning Commission:

- Recommended approval of the 1041 Review with conditions

## Prior uses and development:

- Municipal Operations Center
- Glenwood Maintenance Facility
- Fuel and wash
- Office space
- Existing park and ride



# Project Summary

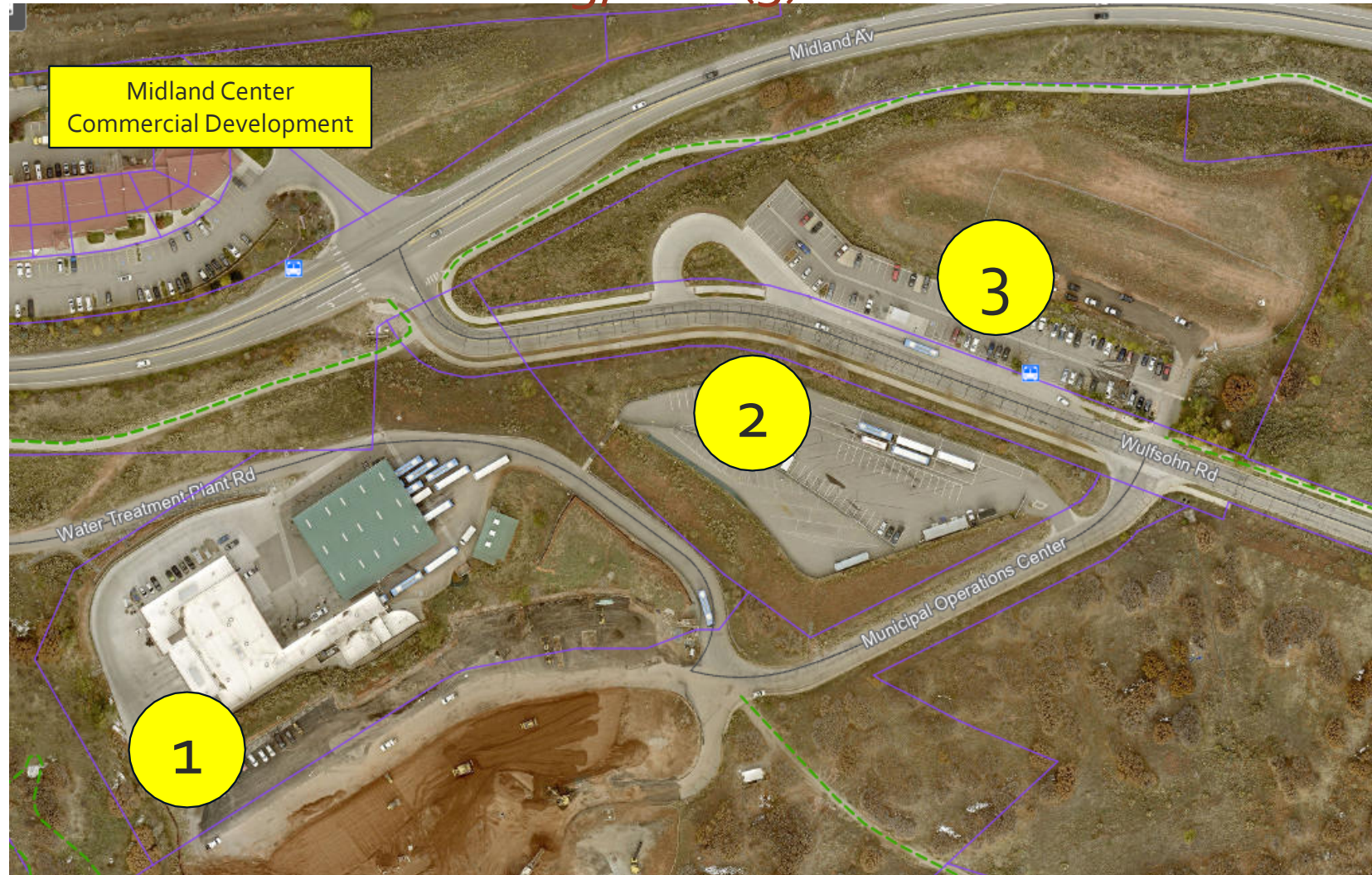
Applicant proposes an expanded transit center, an administration building for RFTA's operations, and a maintenance building.





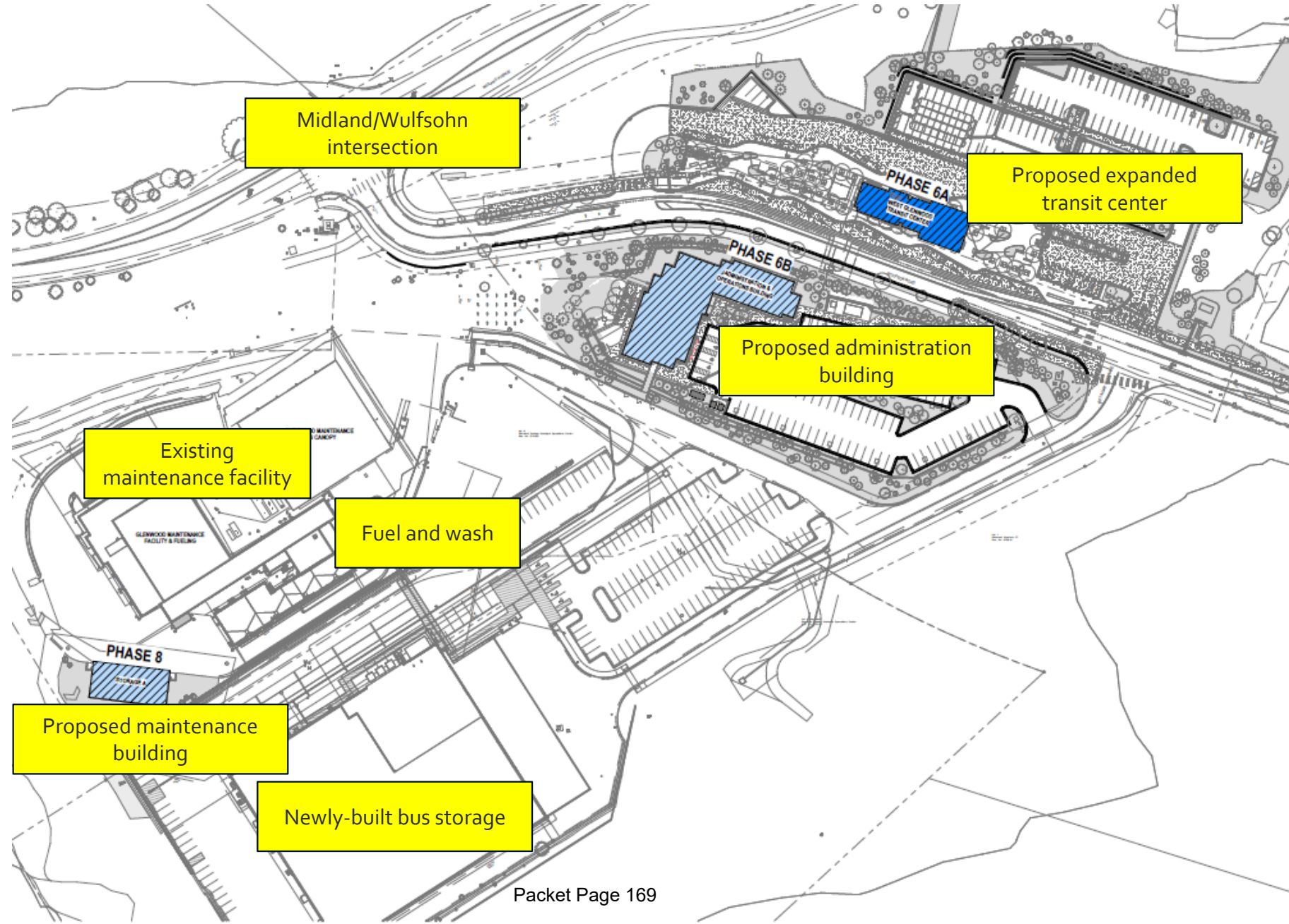
# Site Vicinity

- Three land parcels: (1) maintenance building, (2) administration building, and (3) transit center





# SITE PLAN

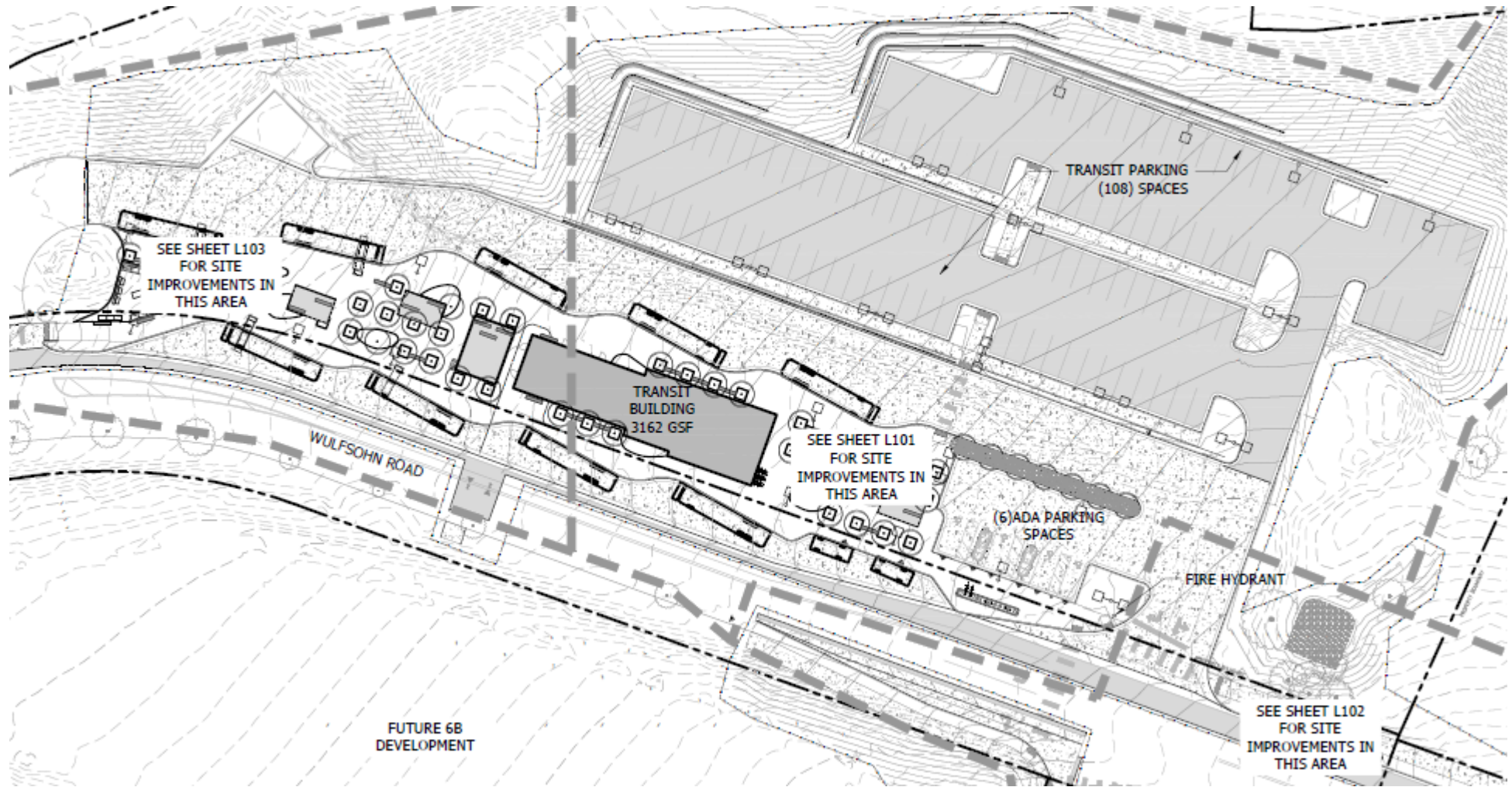


# Site Photos





# Transit Center Site Plan





## Regulations for the transit center

- Section 070.080, Guidelines and Regulations for Matters of State Interest – applies to essential elements of transit center only
- Glenwood Meadows Zoning and Development Plan – regulations applied only to Location & Extent Review analysis (“non-essential elements”)
- “Essential elements” = improvements that substantially impact the 1041 criteria analysis
- “non-essential elements” = design elements that do not impact areas/activities of state interest





## Midland/Wulfsohn Intersection

- Traffic report identifies that this intersection needs improvements
- The transit center will contribute 1.68% traffic increase
- Roundabout is preferred option

# 1041 Review Criteria of Approval

1. The health, welfare, and safety of the residents of this City will be protected and served.
2. The project is in general conformance with the Comprehensive Plan and other duly adopted plans and permit criteria.
3. The project is financially feasible.
4. The project is not subject to significant risk from natural hazards.
5. The project will not have a significant adverse effect on the capability of local governments affected by the project to provide local infrastructure and services, or exceed the capacity of service delivery systems.



# 1041 Review Criteria of Approval, cont'd

6. The project will not have a significant adverse effect on the quality or quantity of recreational opportunities and experience.
7. The project will not significantly degrade air quality.
8. The project will not significantly degrade existing visual quality.
9. The project will not significantly degrade surface water quality.
10. The project will not significantly degrade groundwater quality.
11. The project will not significantly degrade wetlands and riparian areas, terrestrial or aquatic plant or animal life.



# 1041 Review Criteria of Approval, cont'd

12. The project will not significantly deteriorate soils and geologic conditions.
13. The project will not cause a nuisance.
14. The project will not result in unreasonable risk of releases of hazardous materials.
15. Urban development, population densities, and site layout and design of storm water and sanitation systems shall be accomplished in a manner that will prevent the pollution of aquifer recharge areas.
16. The project shall be reasonably necessary to meet projected community development and population demands in the areas to be served by the project, or to comply with regulatory or technological requirements.



# 1041 Review Criteria of Approval, cont'd

17. The project shall be constructed in areas which will result in the proper utilization of existing facilities or systems to ensure the orderly and sustainable development of infrastructure in the City and adjacent communities
18. Economic impacts including, but not limited to, taxable property, licensed and permitted facilities, and recreation related to the proposed project have been identified and will be compensated for or mitigated.
19. The project shall emphasize the most efficient use of water, including the recycling, reuse, and conservation of water



# 1041 Review Criteria of Approval, “Key Facilities”

The following criteria apply to “Key facilities:” airports, public utilities, highway arterials, rapid or mass transit terminals, stations, and fixed guideways.

1. The project will encourage the smooth flow of motorized and nonmotorized traffic.
2. The project will foster the development of such areas in a manner calculated to preserve the smooth flow of such traffic.
3. The project will preserve desirable existing community patterns.

**Staff response: Changes to the Wulfsohn/Midland intersection are necessary to meet these standards. A roundabout has been identified as the preferred alternative.**



# Consistency with Comprehensive Plan – 1041 Review

The proposed project meets the following Comprehensive Plan goals, policies, or actions:

- Promote transit-oriented development
- Expand local transit and enhance regional transit to, from, and through Glenwood Springs
- Support the expansion of green transportation options
- Plan for transit stations located in all mixed-use neighborhoods by incorporating principles of smart growth, new urbanism and green building
- Concentrate growth in Glenwood Springs in locations that can be served by high-frequency transit



# Referral Comments

## Engineering Department

Standard conditions regarding drainage. Stamped letter and on-site monitoring by geotechnical engineer during construction. Contribution requested to future roundabout.

## Public Works

Many comments to plan sets that will be incorporated at Final Plans or building permit. Requests additional information and coordination for drainage, traffic, and electrical plans.

## Fire Department

Some comments on plan sets that will be incorporated at Final Plans or building permit. Changes requested include:

- Fire hydrant in a landscaped island adjacent to admin building
- Campus-style fire alarm





# Public Comments

- None received



## Action 1:

Consideration of a 1041 Review for an expanded transit center.

## Staff Recommendation:

Staff recommends City Council approve the 1041 Review with findings and conditions from the staff report.

## Recommended Findings:

1. The health, welfare, and safety of the residents of this City will be protected and served.
2. The project is in general conformance with the Comprehensive Plan and other duly adopted plans and permit criteria.
3. The project is financially feasible.
4. The project is not subject to significant risk from natural hazards.
5. The project will not have a significant adverse effect on the capability of local governments affected by the project to provide local infrastructure and services, or exceed the capacity of service delivery systems.



## 1041 Review Suggested Findings, cont'd

6. The project will not have a significant adverse effect on the quality or quantity of recreational opportunities and experience.
7. The project will not significantly degrade air quality.
8. The project will not significantly degrade existing visual quality.
9. The project will not significantly degrade surface water quality.
10. The project will not significantly degrade groundwater quality.
11. The project will not significantly degrade wetlands and riparian areas, terrestrial or aquatic plant or animal life.
12. The project will not significantly deteriorate soils and geologic conditions.
13. The project will not cause a nuisance.
14. The project will not result in unreasonable risk of releases of hazardous materials.



# 1041 Review Suggested Findings, cont'd

15. Urban development, population densities, and site layout and design of storm water and sanitation systems shall be accomplished in a manner that will prevent the pollution of aquifer recharge areas.
16. The project shall be reasonably necessary to meet projected community development and population demands in the areas to be served by the project, or to comply with regulatory or technological requirements.
17. The project shall be constructed in areas which will result in the proper utilization of existing facilities or systems to ensure the orderly and sustainable development of infrastructure in the City and adjacent communities.
18. Economic impacts including, but not limited to, taxable property, licensed and permitted facilities, and recreation related to the proposed project have been identified and will be compensated for or mitigated.
19. The project emphasizes the most efficient use of water, including the recycling, reuse, and conservation of water.



## 1041 Review Suggested Findings, cont'd

- 20. With the Conditions of Approval proposed, the project will encourage the smooth flow of motorized and nonmotorized traffic.
- 21. With the Conditions of Approval proposed, the project will foster the development of such areas in a manner calculated to preserve the smooth flow of such traffic.
- 22. With the Conditions of Approval proposed, the project will preserve desirable existing community patterns.



## Recommended Conditions of Approval, 1041 Review:

1. The development shall comply with the requirements of the Code. Any future physical changes or improvements to the property or buildings are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein and approved by the Community Development Director.
3. The applicant shall comply with recommendations identified in the technical reports submitted as part of the application including but not limited to geotechnical and drainage reports.



## Recommended Conditions of Approval, 1041 Review:

4. At the time of Final Plans Review submission, the plans shall be revised to include the following changes:

- a. The transit center plans shall be amended to include offsets in the retaining walls of at least 12 inches every 50 feet.
- b. The sidewalk along Wulfsohn Rd. adjacent to the transit center parcel shall be eight feet in width.
- c. The stormwater detention plans, civil plans, and structural plans shall be revised in consultation with the geotechnical engineer to ensure compliance with the geotechnical report. The applicant shall provide a letter from the geotechnical engineer stating that the stormwater, civil, and structural designs of the transit center comply with the recommendations of the geotechnical report.
- d. The drainage report and corresponding stormwater plans shall be revised to consider the impacts upon the culvert underneath Midland Avenue.



## Recommended Conditions of Approval, 1041 Review:

5. Prior to submitting a building and/or grading permit application, the owner shall:
  - a. Submit and receive approval of a Final Plans application in accordance with Municipal Code section 070.060.050(c).
  - b. Submit an Engineer's Estimate of all public improvements and provide security for completing said improvements per requirements of the Engineering Standards.
  - c. Enter into a Development Agreement that memorializes the development approvals.
  - d. Provide all other permits from outside jurisdictions necessary for the project.
  
6. Prior to issuance of the building permit, the applicant shall:
  - a. Obtain Right-of-Way Encroachment Licenses for all private uses or structures to be located within the right-of-way.





## Recommended Conditions of Approval, 1041 Review:

7. Prior to issuance of the Certificate of Completion, owner shall provide as-built plans and an Improvement Survey Plat per the Engineering Standards.
8. Before commencement of roundabout construction, RFTA shall contribute funding to the actual construction cost of a roundabout at the western Midland Avenue/Wulfsohn Road intersection in a percentage amount equal to the percentage increase in traffic volume at the intersection attributable to RFTA's Phase 6A. This will be memorialized in the Development Agreement.



## Recommended Conditions of Approval, 1041 Review:

9. RFTA shall request can and will serve letters for electric service for any electric load beyond what is required to service the development as submitted in the plans. These elements included in the plans include all items on the Glenwood Springs Electric Department estimate titled "RFTA 6A & 6B" dated January 15, 2025, and included with the February 6, 2025 staff report packet. All items noted as "future" in the plans, such as future electric bus chargers, shall be subject to review by the Electric Department.
10. All repairs, encroachments and replacements to Wulfsohn Road associated with the transit center construction shall be replaced with road cross sections meeting City standards. These cross section designs, as may be amended, are shown in "Glenwood Meadows City Standard Roadway Details" along with the general locations of roadway replacement areas.



## Recommended Conditions of Approval, 1041 Review:

11. The applicant shall comply with and address all City referral comments prior to the issuance of a grading permit or building permit.







# Appendix

# Compliance with Regulations – Transit Center

| CODE STANDARD                        |                                                                                  | PROPOSED     | REQUIREMENT MET     | CODE STANDARD           |                                                                        | PROPOSED                  | REQUIREMENT MET     |
|--------------------------------------|----------------------------------------------------------------------------------|--------------|---------------------|-------------------------|------------------------------------------------------------------------|---------------------------|---------------------|
| Landscape                            | 30%; 65,732 square feet                                                          | 42,760       | NO                  | Streetscape landscaping |                                                                        |                           |                     |
| Landscaping specific standards       |                                                                                  |              |                     | Street trees            | 1 tree per 35 linear feet of street frontage; 25 street trees required | 16                        | NO                  |
| Trees                                | 1 per 1,000 s.f. of required landscaped area; 66 trees                           | 97           | YES                 | Setback                 |                                                                        |                           |                     |
| Shrubs                               | 4 per 1,000 s.f. of required landscaped area; 263 required                       | 210          | NO                  | Front                   | 5' minimum, 25' maximum                                                | 4.8'                      | NO                  |
| Native and drought-resistant species | Native and drought tolerant species must account for 75% of plantings            | Not provided | NO                  | Rear                    | 5'                                                                     | Not provided              | YES                 |
| Parking Area Landscaping             |                                                                                  |              |                     | Side                    | 5'                                                                     | Not provided              | YES                 |
| Interior Landscaping                 | 20% of total covered parking area; required amount needs clarification           | 2,325 s.f.   | Needs clarification | Height                  | 40' maximum                                                            | 28'4"                     | YES                 |
| Parking Area Trees                   | 2 trees per 200 s.f. landscaped island area; required amount needs clarification | 19           | Needs clarification | Parking                 | 1 per 300 s.f.                                                         | 98                        | 105                 |
|                                      |                                                                                  |              |                     | Sidewalk                | 8 feet in width along Wulfsohn Rd.                                     | Not provided              | NO                  |
|                                      |                                                                                  |              |                     | Bike Parking            | 6 bike parking spaces                                                  | 6                         | YES                 |
|                                      |                                                                                  |              |                     | Exterior lighting       |                                                                        |                           |                     |
|                                      |                                                                                  |              |                     | Parking area lighting   | Must be between 0.7 and 7.0 foot-candles                               | All readings within range | YES                 |
|                                      |                                                                                  |              |                     | Light mounting heights  | 35-foot maximum                                                        | Not provided              | Needs clarification |



## Compliance with Regulations – Transit Center

- Check marks for some things, separate slides for landscaping, ROW encroachments, parking islands,
  - ☒ Height maximums
  - ☒ Building design and materials
  - ☒ Parcel-specific development standards from GMZDP
  - ☐ Landscaping
  - ☐ Parking lot design
  - ☐ ROW Encroachment License to be required



# Compliance with Regulations – Transit Center

- **Landscaping issues to fix:**
  - Increase landscaping area to 30%
  - Increase number of shrubs or show that requirements are met with existing shrubs on the site
  - Increase the percentage of species in the landscaping plan that are native and drought-resistant to at least 75%
  - Provide parking area landscaping as percentage of total parking area; if necessary, revise plans to meet these standards
  - Provide area of landscaped islands; if necessary, revise plans to include the required number of tree plantings
  - Increase street trees to meet requirements





# Compliance with Regulations – Transit Center

- **Parking islands and landscaping:** the transit center's parking design needs to be revised to incorporate more landscaped islands, per the GMZDP
  - Parking islands are required every 8 parking spaces



# Compliance with Regulations – Transit Center

- Numerous components of the transit center are shown in the right-of-way. These will require Right-of-Way Encroachment Licenses
  - We-Cycle station
  - Fences
  - Retaining walls
  - Paneling for electric charging infrastructure
  - Storm sewer
  - Bus chargers



# Compliance with Regulations – Administration and Maintenance Buildings

- **Retaining walls** - Applicants propose a terraced retaining wall that would reach 11 feet – greatly exceeding the 6-foot maximum
- **Landscaping** – Several noncompliant standards:
  - Street trees
  - Percentage native and drought-resistant
  - Perennial plantings
  - Shrub plantings
  - Parking area landscaping



# Compliance with Regulations – Administration and Maintenance Buildings

- **Building height** – maximum height is 40', with the following allowed exceptions:
  - Parapet walls – may exceed limit by 2.5'
  - Elevator tower – may exceed limit by 10'
  - Rooftop mechanical equipment – may exceed by 5'
- **Proposed height: 48'8"**





## Planning and Zoning Commission Report

Date: January 28, 2025  
To: Planning and Zoning Commission  
From: Watkins Fulk-Gray, Senior Planner, AICP  
Subject: Planning File #21-24, Matters of State Interest 1041 Permit Application, and Location and Extent for Roaring Fork Transportation Authority

|                       |                                                                                                                                               |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| REQUEST               | Matters of State Interest 1041 Permit for a new transit center and Location & Extent Review for a new administration and maintenance building |
| APPLICANT             | DHM Corporation                                                                                                                               |
| OWNER                 | Roaring Fork Transportation Authority (RFTA)                                                                                                  |
| LOCATION              | 2307 Wulfsohn Road (PIN 218505337001, 218505337003, and 218505336002)                                                                         |
| ZONE                  | M1 (Mixed Use Corridor) and I1 (Light Industrial)                                                                                             |
| SURROUNDING LAND USES | North: Right-of-Way Corridor<br>South: Parkland/Open Space<br>East: Vacant<br>West: Vacant                                                    |
| LOT SIZE              | 12.65 acres, based on Assessor's records                                                                                                      |

### **ACTION ITEMS**

**Action 1 – 1041 Review** – to consider recommendation of approval of a 1041 Review for construction of a new 9-bay transit center with a 3,232-square foot building.

**Staff recommendation:** *Staff recommends **approval** of the 1041 Review with the findings and conditions at the end of this report.*

**Action 2 – Location & Extent Review** – to consider approval of a Location & Extent Review for construction of a new 29,185-square foot administration building and a 2,720-square foot maintenance building.

**Staff recommendation:** *Staff recommends **approval** of the Location & Extent Review with the findings and conditions at the end of this report.*

Background and purpose for memo:

At the Planning & Zoning Commission's December 17 meeting, the P&Z continued both the 1041 Review and Location & Extent Review action items. Since then Staff has gained more clarity about three key issues discussed on December 17<sup>th</sup>: the traffic report, the requirement for the applicant to contribute toward roundabout construction, and about upgrades to the City's electrical infrastructure.

After review by the City's legal counsel, the City believes that nothing in the Annexation and Development Agreement prevents it from requiring contribution to the roundabout. At the December 17<sup>th</sup> meeting, the applicant requested removal of this condition of approval and argued that the Agreement absolves them from having to make transportation-related improvements. With this question resolved, the City has included a condition of approval for roundabout contribution, discussed below.

The City asked RFTA to revise its traffic report after it was discovered that the traffic report included some land use components that RFTA is not proposing at this time. The revised traffic reports for all three phases have been received, and although they recommend modifications to the existing turn lanes, the City has opted to program a roundabout at the Midland/Wulfsohn intersection. Based on the traffic report's findings, Staff is recommending a condition of approval that RFTA be required to contribute a percentage of the roundabout construction equal to the percentage of traffic volume increase at the Wulfsohn/Midland intersection after the new transit center is completed.

After receiving analysis from the City's electrical consultants, the City believes it can accommodate RFTA's proposed new load in Phases 6A, 6B, and 8 without infrastructure upgrades. A condition of approval has been recommended that will require RFTA to contribute toward electric infrastructure upgrades beyond what will be needed to service the project as it is laid out in the plans, which means that the two "future" bus chargers shown on the plans will need to be negotiated with the City. The improvements necessary to service the project as described in the plans are listed in an attachment to this packet. The attachment is a Glenwood Springs Electric Department estimate titled "RFTA 6A & 6B" and dated January 15, 2025, and also includes Phase 8.

Staff would like to provide a clarification for how the two action items, Location & Extent Review and 1041 Review, interact with each other. For simplicity the two projects were presented on December 17<sup>th</sup> geographically: Location & Extent applying to the administration building and maintenance building (Phase 6B and Phase 8) and the 1041 Review as the transit center (Phase 6A). Staff would like to clarify that the Location & Extent Review also applies to the transit center phase, including some of the design elements not pertinent to 1041 Review. Staff calls out three areas of nonconformance with the Glenwood Meadows Zoning and Development Plan (GMZDP) contained in the Annexation and Development Agreement, specifically parking lot design, lighting design, and landscaping; the P&Z Commission may choose to apply flexibility towards these elements under the Location & Extent Criteria. This means that both Location & Extent and 1041 Review approvals are required for the ultimate approval of the transit center phase.

Specifically, the parking lot design requirements in the GMZDP include parking lot islands. The City of Glenwood Springs Code eliminated parking lot islands in 2018 instead favoring

landscaping areas at the end of rows. The requirement of islands would reduce the parking spaces further which is not a logical approach for a Park & Ride service. Staff encourages P&Z Commission to review these aspects for flexibility under the Location and Extent application.

#### Changes to Recommended Conditions of Approval

The recommended findings and conditions of approval have been restated in their entirety in this memo. For clarity Staff has also provided the following summary of changes from the conditions of approval recommended on December 17<sup>th</sup>:

- Conditions recommending changes to the transit center parcel's landscaping, lighting, and retaining walls were moved to the Location & Extent Review conditions list.
- Modified roundabout contribution conditions
- The electric infrastructure condition of approval has been modified to require Electric Department review for electric infrastructure upgrades beyond what will be needed to service the project as it is laid out in the plans. The electric bus chargers shown as "future" in the plans will be subject to this future review. In other words, no contribution toward electric infrastructure beyond typical system improvement fees are requested for Phases 6A, 6B, and 8.
- The standard condition "The applicant shall comply with and address all City referral comments prior to the issuance of a grading permit or building permit" was not included in the previous staff report, but was noted and recommended in the staff presentation on December 17<sup>th</sup>. This condition is included in the recommended conditions list in this memo.
- Condition about updating traffic report has been removed because that has been completed.
- Condition about piping for irrigation underneath Wulfsohn Road has been removed because RFTA and the City have agreed on a way to manage this.
- A new condition has been added requiring RFTA to reconstruct per City standards the portions of Wulfsohn Road that will be removed for the transit center construction. Buses can have severe negative impacts on road surfaces, especially in areas where they are turning and braking. A 2023 geotechnical study led to the development of preferred road cross sections for roads built on the particular soils found in Glenwood Meadows that will allow the roads to hold up to the weight and forces of buses. These technical specifications for road cross sections have been included as an attachment in the information packet, and the document also contains general areas where this pavement replacement will need to occur.

#### **ACTION ITEMS & STAFF RECOMMENDATIONS**

Staff recommends approval of the **1041 Review application** with the following suggested conditions:

**Recommended Conditions of Approval (1041 Review only):**

1. The development shall comply with the requirements of the Code. Any future physical changes or improvements to the property or buildings are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein and approved by the Community Development Director.
3. The applicant shall comply with recommendations identified in the technical reports submitted as part of the application including but not limited to geotechnical and drainage reports.
4. At the time of Final Plans Review submission, the plans shall be revised to include the following changes:
  - a. The transit center plans shall be amended to include offsets in the retaining walls of at least 12 inches every 50 feet.
  - b. The sidewalk along Wulfsohn Rd. adjacent to the transit center parcel shall be eight feet in width.
  - c. The stormwater detention plans, civil plans, and structural plans shall be revised in consultation with the geotechnical engineer to ensure compliance with the geotechnical report. The applicant shall provide a letter from the geotechnical engineer stating that the stormwater, civil, and structural designs of the transit center comply with the recommendations of the geotechnical report.
  - d. The drainage report and corresponding stormwater plans shall be revised to consider the impacts upon the culvert underneath Midland Avenue.
5. Prior to submitting a building and/or grading permit application, the owner shall:
  - a. Submit and receive approval of a Final Plans application in accordance with Municipal Code section 070.060.050(c).
  - b. Submit an Engineer's Estimate of all public improvements and provide security for completing said improvements per requirements of the Engineering Standards.
  - c. Enter into a Development Agreement that memorializes the development approvals.
  - d. Provide all other permits from outside jurisdictions necessary for the project.
6. Prior to issuance of the building permit, the applicant shall:
  - a. Obtain Right-of-Way Encroachment Licenses for all private uses or structures to be located within the right-of-way.
7. Prior to issuance of the Certificate of Completion, owner shall provide as-built plans and an Improvement Survey Plat per the Engineering Standards.



8. Before commencement of roundabout construction, RFTA shall contribute funding to the actual construction cost of a roundabout at the western Midland Avenue/Wulfsohn Road intersection in a percentage amount equal to the percentage increase in traffic volume at the intersection attributable to RFTA's Phase 6A. This will be memorialized in the Development Agreement.
9. RFTA shall request can and will serve letters for electric service for any electric load beyond what is required to service the development as submitted in the plans. These elements included in the plans include all items on the Glenwood Springs Electric Department estimate titled "RFTA 6A & 6B" dated January 15, 2025, and included with the January 28, 2025 staff report packet. All items noted as "future" in the plans, such as future electric bus chargers, shall be subject to review by the Electric Department.
10. All repairs, encroachments and replacements to Wulfsohn Road associated with the transit center construction shall be replaced with road cross sections meeting City standards. These cross section designs are shown in the attachment "Glenwood Meadows City Standard Roadway Details" along with the general locations of roadway replacement areas.
11. The applicant shall comply with and address all City referral comments prior to the issuance of a grading permit or building permit.

**Suggested Findings for the 1041 Review:**

*The full staff analysis for this and the Location & Extent Review can be found in the December 17<sup>th</sup> staff report.*

- (1) The health, welfare, and safety of the residents of this City will be protected and served.
- (2) The project is in general conformance with the Comprehensive Plan and other duly adopted plans and permit criteria.
- (3) The project is financially feasible.
- (4) With the Conditions of Approval proposed, the project is not subject to significant risk from natural hazards.
- (5) With the Conditions of Approval proposed, the project will not have a significant adverse effect on the capability of local governments affected by the project to provide local infrastructure and services, or exceed the capacity of service delivery systems.
- (6) The project will not have a significant adverse effect on the quality or quantity of recreational opportunities and experience.
- (7) The project will not significantly degrade air quality.

- (8) The project will not significantly degrade existing visual quality.
  - (9) With the Conditions of Approval proposed, the project will not significantly degrade surface water quality.
  - (10) With the Conditions of Approval proposed, the project will not significantly degrade groundwater quality.
  - (11) The project will not significantly degrade wetlands and riparian areas, terrestrial or aquatic plant or animal life.
  - (12) The project will not significantly deteriorate soils and geologic conditions.
  - (13) The project will not cause a nuisance.
  - (14) The project will not result in unreasonable risk of releases of hazardous materials.
  - (15) Urban development, population densities, and site layout and design of storm water and sanitation systems shall be accomplished in a manner that will prevent the pollution of aquifer recharge areas.
  - (16) The project shall be reasonably necessary to meet projected community development and population demands in the areas to be served by the project, or to comply with regulatory or technological requirements.
  - (17) The project shall be constructed in areas which will result in the proper utilization of existing facilities or systems to ensure the orderly and sustainable development of infrastructure in the City and adjacent communities.
  - (18) Economic impacts including, but not limited to, taxable property, licensed and permitted facilities, and recreation related to the proposed project have been identified and will be compensated for or mitigated.
  - (19) The project emphasizes the most efficient use of water, including the recycling, reuse, and conservation of water.
  - (20) With the Conditions of Approval proposed, the project will encourage the smooth flow of motorized and nonmotorized traffic.
  - (21) With the Conditions of Approval proposed, the project will foster the development of such areas in a manner calculated to preserve the smooth flow of such traffic.
  - (22) With the Conditions of Approval proposed, the project will preserve desirable existing community patterns.
-

## **LOCATION & EXTENT CRITERIA OF APPROVAL**

Per section 070.060.050 of the Municipal Code:

In reviewing a proposed Location and Extent application, the Planning Commission shall consider whether or not the proposed location and extent:

- i. Is consistent with the Comprehensive Plan and other City plans and policies;
- ii. Is consistent with the general purpose and intent of this Code; and
- iii. Minimizes adverse impacts to the health, safety, and welfare of the inhabitants of the surrounding areas and the city.

With the conditions of approval recommended in this report, Staff believes that these three criteria are met for the administration building and maintenance building.

Staff recommends approval of the **Location & Extent application** with the following suggested conditions:

### **Recommended Conditions of Approval for Location & Extent Review:**

1. The development shall comply with the requirements of the Code. Any future physical changes or improvements to the property or buildings are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein and approved by the Community Development Director.
3. The applicant shall comply with recommendations identified in the technical reports submitted as part of the application including but not limited to geotechnical and drainage reports.
4. Prior to building permit review of the administration building and maintenance building, the plans shall be revised to include the following changes:
  - a. Show required common open space and calculate its percentage of the administration building parcel.
  - b. Revise landscaping plan showing compliance with landscaping standards, streetscape standards, and parking area landscaping standards on the administration building parcel.
  - c. Provide mounting heights of outdoor light fixtures that do not exceed 35 feet in height.
  - d. Revise outdoor lighting plan to reduce estimated illumination levels to within allowed levels.
  - e. Wherever feasible, reduce height of retaining walls to allowed limits and include methods such as terracing and screening to reduce the visual impact of these walls.
  - f. Add sidewalk width along Wulfsohn Rd. to plans. The minimum width shall be eight feet.
  - g. Revise administration building plans to comply with code requirements

- for maximum height.
- h. A fire hydrant shall be installed on a landscaping island near the administration building.
  - i. The stormwater detention plans, civil plans, and structural plans shall be revised in consultation with the geotechnical engineer to ensure compliance with the geotechnical report. The applicant shall provide a letter from the geotechnical engineer stating that the stormwater, civil, and structural designs of the transit center comply with the recommendations of the geotechnical report.
5. Prior to building permit review of the transit center, the plans shall be revised to include the following changes:
- a. The transit center plans shall be amended to include offsets in the retaining walls of at least 12 inches every 50 feet.
  - b. The landscaping plans for the transit center parcel shall be revised to meet City and GMZDP landscaping standards, including parking area landscaping, street trees, and minimum rates of native and drought-resistant species.
  - c. The transit center building shall be adjusted to meet front setback requirements or shall receive approval through the Municipal Code's flexibility procedures.
  - d. The architectural plans for the transit center building shall be revised to incorporate at least two design elements from section V.D.2.c of the Zoning and Development Plan.
  - e. Revise plans to include mounting heights of outdoor light fixtures that do not exceed 35 feet in height.
  - f. The portion of the retaining wall north of the parking area that is shown encroaching on a utility easement shall be adjusted so that it does not encroach on the utility easement.
6. The drainage report and corresponding stormwater plans shall be revised to consider the impacts upon the culvert underneath Midland Avenue.
7. Prior to submitting a building and/or grading permit application, the owner shall:
- a. Submit an Engineer's Estimate of all public improvements and provide security for completing said improvements per requirements of the Engineering Standards.
8. Prior to approval of a building permit, the Minor Subdivision Plat of Glenwood Springs Municipal Operations Center shall be amended and recorded removing all easements that conflict with the proposed maintenance building, if any conflict.
9. Prior to issuance of the Certificate of Completion, owner shall provide as-built plans and an Improvement Survey Plat per the Engineering Standards.
10. RFTA shall request can and will serve letters for electric service for any electric load beyond what is required to service the development as submitted in the plans. These elements included in the plans include all items on the Glenwood Springs Electric Department estimate titled "RFTA 6A & 6B" dated January 15, 2025, and included with the January 28, 2025 staff report packet. All items noted as "future" in the plans, such as future electric bus chargers, shall be subject to review by the Electric Department.

11. The applicant shall comply with and address all City referral comments prior to the issuance of a grading permit or building permit.

**Suggested Findings for Location & Extent Review:**

- (1) With the Conditions of Approval proposed, the project is consistent with the Comprehensive Plan;
- (2) With the Conditions of Approval proposed, the project is consistent with the general purpose and intent of the Municipal Code; and
- (3) With the Conditions of Approval proposed, the project minimizes adverse impacts to the health, safety, and welfare of the inhabitants of the surrounding areas and the city.



## Planning and Zoning Commission Report

Date: December 17, 2024  
To: Planning and Zoning Commission  
From: Watkins Fulk-Gray, Senior Planner, AICP  
Subject: Planning File #21-24, Matters of State Interest 1041 Permit Application, and Location and Extent for Roaring Fork Transportation Authority

|                       |                                                                                                                                               |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| REQUEST               | Matters of State Interest 1041 Permit for a new transit center and Location & Extent Review for a new administration and maintenance building |
| APPLICANT             | DHM Corporation                                                                                                                               |
| OWNER                 | Roaring Fork Transportation Authority (RFTA)                                                                                                  |
| LOCATION              | 2307 Wulfsohn Road (PIN 218505337001, 218505337003, and 218505336002)                                                                         |
| ZONE                  | M1 (Mixed Use Corridor) and I1 (Light Industrial)                                                                                             |
| SURROUNDING LAND USES | North: Right-of-Way Corridor<br>South: Parkland/Open Space<br>East: Vacant<br>West: Vacant                                                    |
| LOT SIZE              | 12.65 acres, based on Assessor's records                                                                                                      |

### ACTION ITEMS

**Action 1 – 1041 Review** – to consider recommendation of approval of a 1041 Review for construction of a new 9-bay transit center with a 3,232-square foot building.

**Staff recommendation:** *Staff recommends **approval** of the 1041 Review with the findings and conditions at the end of this report.*

**Action 2 – Location & Extent Review** – to consider recommendation of approval of a Location & Extent Review for construction of a new 29,185-square foot administration building and a 2,720-square foot maintenance building.

**Staff recommendation:** *Staff recommends **approval** of the Location & Extent Review with the findings and conditions at the end of this report.*

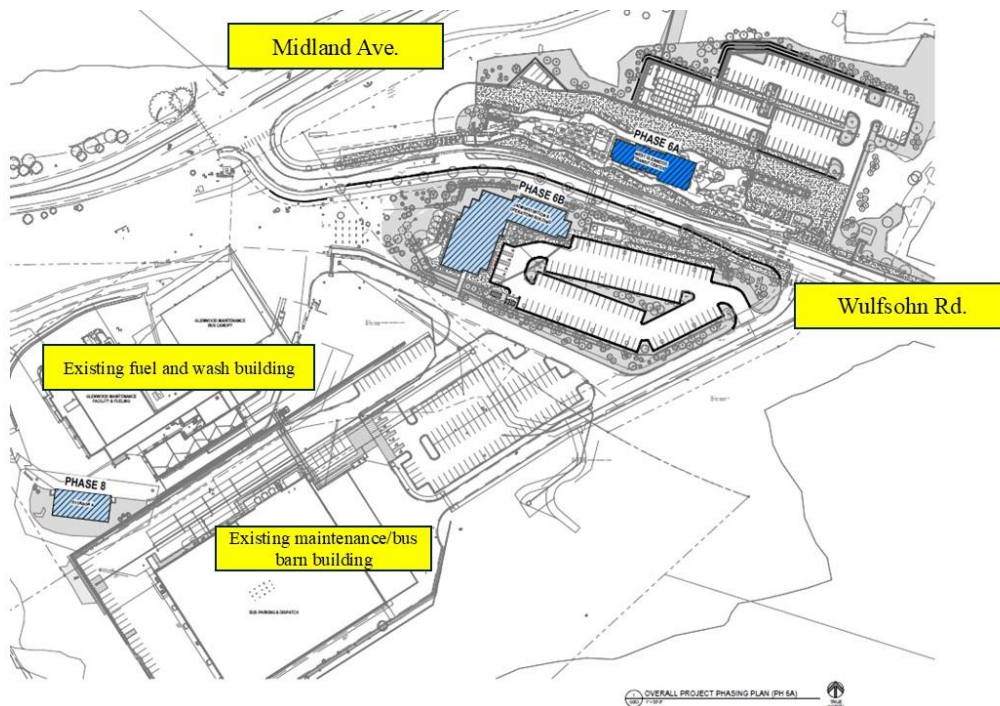
The Planning & Zoning Commission is the deciding body for Location & Extent Reviews and the recommending body for 1041 Reviews, which are decided by City Council.

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## **BACKGROUND AND PROJECT SUMMARY**

This project consists of two action items, a 1041 Review and Location & Extent Review, that together, encompass three buildings, on three parcels, constituting three phases of the Roaring Fork Transportation Authority's plans to make Glenwood Springs its hub of operations. These two related but separate applications will be governed by different but overlapping sets of regulations. The 1041 Review, for an expanded transit center at the existing West Glenwood Park'n'Ride, is subject to standards for the Glenwood Meadows Annexation and Development Agreement (GMADA), the Municipal Code's 1041 regulations that are described below, and also by certain sections of the Municipal Code where the GMADA is silent. The Location & Extent Review, for a new administration office building and a new maintenance building, is subject to the Municipal Code and its Sensitive Area Protection standards. These sets of regulations will be discussed in the staff analysis sections of this report.

In March of 2022, City Council passed a Code Amendment adopting Article 070.080 – Guidelines and Regulations for Matters of State Interest. The purpose and intent of the regulations is to facilitate the identification, designation, and administration of matters of State interest consistent with the statutory requirements in C.R.S. § 24-65.1-101 and the guidelines established in the Comprehensive Plan. The standards are designed to prevent unsuitable site selection for public utilities, protect scenic and recreational assets, minimize environmental impacts, avoid incompatible uses, avoid conflict with other land use plans, protect the character of the City, promote efficient economic use of public resources, and preserve the health and welfare of the citizens of the City.



Above: Overall site plan of all three proposed facilities.

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## **REVIEW CRITERIA AND STAFF ANALYSIS – 1041 REVIEW**

The 1041 Review component of this project, for the proposed transit center, has been reviewed according by regulations set forth in Article 070.080 - Guidelines and Regulations for Matters of State Interest of the Municipal Code that apply to the 1041 Review. This analysis, and the summary table below, is a summary of compliance with regulations for only the **transit center building (Phase 6A)**.

| <b><u>CODE STANDARD</u></b>          |                                                                                  | <b><u>PROPOSED</u></b> | <b><u>REQUIREMENT<br/>MET</u></b> |
|--------------------------------------|----------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Landscape                            | 30%; 65,732 square feet                                                          | 42,760                 | NO                                |
| Landscaping specific standards       |                                                                                  |                        |                                   |
| Trees                                | 1 per 1,000 s.f. of required landscaped area;<br>66 trees                        | 97                     | YES                               |
| Shrubs                               | 4 per 1,000 s.f. of required landscaped area;<br>263 required                    | 210                    | NO                                |
| Native and drought-resistant species | Native and drought tolerant species must account for 75% of plantings            | Not provided           | NO                                |
| Parking Area Landscaping             |                                                                                  |                        |                                   |
| Interior Landscaping                 | 20% of total covered parking area; required amount needs clarification           | 2,325 s.f.             | Needs clarification               |
| Parking Area Trees                   | 2 trees per 200 s.f. landscaped island area; required amount needs clarification | 19                     | Needs clarification               |
| Streetscape landscaping              |                                                                                  |                        |                                   |
| Street trees                         | 1 tree per 35 linear feet of street frontage; 25 street trees required           | 16                     | NO                                |
| Setback                              |                                                                                  |                        |                                   |



|                        |                                          |                           |                     |
|------------------------|------------------------------------------|---------------------------|---------------------|
| Front                  | 5' minimum, 25' maximum                  | 4.8'                      | NO                  |
| Rear                   | 5'                                       | Not provided              | YES                 |
| Side                   | 5'                                       | Not provided              | YES                 |
| Height                 | 40' maximum                              | 28'4"                     | YES                 |
| Parking                | 1 per 300 s.f.                           | 98                        | 105                 |
| Sidewalk               | 8 feet in width along Wulfsohn Rd.       | Not provided              | NO                  |
| Bike Parking           | 6 bike parking spaces                    | 6                         | YES                 |
| Exterior lighting      |                                          |                           |                     |
| Parking area lighting  | Must be between 0.7 and 7.0 foot-candles | All readings within range | YES                 |
| Light mounting heights | 35-foot maximum                          | Not provided              | Needs clarification |

#### *Setbacks*

The proposed transit center is subject to Municipal Code standards for setbacks. The front of the building sits slightly too close to the property line; a condition of approval has been recommended that the building move back 0.2 feet to meet setback requirements, or to pursue a flexibility measure such as administrative adjustment for reducing setbacks.

#### *Building height*

The proposed transit center building, at 28 feet, is under the maximum allowed height.

#### *Building design and materials*

The GMADA contains specific design and building material requirements.

A requirement for recessed customer entrances does not apply to the proposed transit center. While the building has interior spaces, it is not a retail development where people enter and exit and where the entrance would merit special design treatment. As a transit center, the focal point is the outdoor transit platform and outdoor seating area.

As a nonresidential building less than 60,000 square feet, the transit center building must have at least two of the five design elements listed in the GMADA for every 30 feet of building elevation. The design proposed includes changes in color, texture, or materials, meeting one of the design requirements. The design could also incorporate projections and reveals, but not enough detail is available to determine if this second design element is present. A condition of approval has been recommended to ensure that these design criteria are met.

The transit center proposal meets the GMADA requirements for building design and materials. The building design features exterior materials of stone veneer, earth-toned architectural wall panels, and steel accents.



Above: The proposed Wulfsohn Road-facing elevation of the transit center.

#### *Vehicular and Pedestrian Circulation and Access:*

The GMADA requires direct and clear vehicular paths from the entrance to parking areas and pedestrian access to the site and to the entrances of buildings. These elements are all achieved.

#### *Parking:*

As required by the GMADA, parking is terraced and distributed to where there is less visual impact.

#### *Landscaping*

The proposed landscaping and parking area landscaping for the transit center parcel needs revision to meet the GMADA standards. The parcel on which the proposed transit center is located requires a significantly higher amount of landscaping area to be set aside than the Municipal Code would if it were the controlling set of regulations. The GMADA requires 30% of the parcel to be set aside for landscaping, and further specifies the minimum number of plantings within the areas of landscaping. The GMADA requires 20% of the total parking area to be set aside also for landscaping, with specific planting requirements within the parking lot landscaping area.

The GMADA also contains specific requirements for street trees along Wulfsohn Rd. One street tree for every 35 linear feet of street frontage are required to be planted; with 875 linear feet of frontage along Wulfsohn Rd., this equates to 25 required trees. Only 16 are currently proposed. This situation is made more difficult because of the nature of a transit center, which needs a significant amount of the frontage to be open for bus travel.

Below is a summary of landscaping information that needs to be provided in RFTA's next submission or needs to be changed to meet regulations:

- Increase landscaping area to 30%
- Increase number of shrubs or show that requirements are met with existing shrubs on the site
- Increase the percentage of species in the landscaping plan that are native and drought-resistant to at least 75%
- Provide parking area landscaping as percentage of total parking area; if necessary, revise plans to meet these standards
- Provide area of landscaped islands; if necessary, revise plans to include the required number of tree plantings

- Increase street trees to meet requirements

These issues have been included in the recommended conditions of approval.

#### *Parking lot landscaping*

Need to redesign to meet standards. The parking area will need to be redesigned to meet GMADA requirements, which state that parking rows need to be broken up by landscaped islands with no more than eight parking spaces in a row, with specific planting requirements in the landscaped islands. This has been included as a recommended condition of approval.

#### *Retaining walls*

There are numerous retaining walls proposed that are longer than 50 feet. The GMADA requires a break in retaining walls for every 50 feet. Height limits for retaining walls are six feet, which the project plans state are feasible. A condition of approval has been included requiring offsets in these retaining walls at least every 50 feet.

A small portion of a retaining wall north of the parking area is shown encroaching on a utility easement. A condition of approval has been recommended that the retaining walls be moved outside the easement.

#### *Exterior lighting*

The photometric plans for the proposed transit center show that the estimated illumination levels meet the ranges allowed by the Municipal Code. The mounting heights of the light fixtures are not provided in the plans; a condition of approval has been suggested that they be specified as not exceeding the 35' maximum.

#### *Community amenities*

The GMADA requires a minimum of 1,000 square feet of outdoor shared community amenity space per 50,000 square feet of commercial building area or a percentage thereof. This amenity space is intended to be a gathering space such as patios or plazas with seating area, mini-parks, water features, and clock towers, with flexibility allowed for developments that are "similar deliberately shaped area and/or focal feature," in the City's judgment. Staff believes that the nature of a transit center, with its seating and the focal point of the platform, meets this requirement without the need for additional amenities.

#### *Improvements in the right-of-way*

Several portions of the proposed transit center are in City right-of-way (ROW). This situation is only allowed when the City intends to take ownership of the improvements or when permitted by a ROW Encroachment License. The elements proposed to be located in the ROW include, the We-Cycle station, fences, retaining walls, paneling for electric charging infrastructure, storm sewer, and portions of the bus chargers. A condition of approval has been recommended requiring approval of a ROW Encroachment License for any private property or structures associated with the transit center that are to be located in the ROW.

#### *Development Standards for Parcel "A", Mixed-Use Campus*

The GMADA contains standards that are specific to the site location, which is designated "Mixed-Use Campus." The proposed design meets these specific standards in the following

ways:

- 1) The transit center is oriented toward Wulfsohn as required.
- 2) No design transitions are necessary because the proposed development does not border residential developments.
- 3) While the rest of the Mixed Use Campus sub-area is undeveloped, this project will allow it to be connected and integrated with its sidewalk along Wulfsohn Road.

#### *Sidewalks*

Sidewalk widths are not shown on the plans. Current sidewalk widths are five feet, but to meet code, they must be upgraded to eight feet. A condition of approval has been recommended for this.

### **REVIEW CRITERIA SPECIFIC TO 1041 REGULATIONS**

All applications for 1041 Review must be evaluated against the following 19 general criteria. Staff review and analysis are included below with inset text below each criterium. Where such terms as "reasonable," "feasible" and "adequate" are used in the foregoing criteria, the Community Development Department Director shall determine in each case what is or is not reasonable, feasible, or adequate. Staff analysis is included in **BOLD** below the criteria.

- (1) The health, welfare, and safety of the residents of this City will be protected and served.

**Staff believes that with the included conditions of approval, the proposed transit center development will serve and improve the health, safety, and welfare of residents.**

- (2) The project is in general conformance with the Comprehensive Plan and other duly adopted plans and permit criteria.

**The proposed transit center is in general conformity with the Comprehensive Plan, supporting goals, policies, and actions such as:**

- **Promote transit-oriented development**
- **Expand local transit and enhance regional transit to, from, and through Glenwood Springs**
- **Support the expansion of green transportation options**
- **Plan for transit stations located in all mixed-use neighborhoods by incorporating principles of smart growth, new urbanism and green building**
- **Concentrate growth in Glenwood Springs in locations that can be served by high-frequency transit**

- (3) The project is financially feasible. The determination of financial feasibility of the project may include but is not limited to the following considerations:
  - a. The business plan submitted by the applicant.
  - b. Relevant bond issue, loan and other financing approval or certifications (ex: approved bond issue; bond counsel opinion).

**The applicant organization, RFTA, has provided evidence that they have a diverse and substantial set of funding sources to make the project feasible.**

(4) The project is not subject to significant risk from natural hazards. The determination of risk from natural hazards to the project may include but is not limited to the following considerations:

- a. Faults and fissures.
- b. Unstable slopes including landslides, rock slides, and avalanche areas.
- c. Expansive or evaporative soils and risk of subsidence.
- d. Wildfire hazard areas.
- e. Floodplains.

**Geohazards—hydrocompactive soils and debris fan—do exist on this site, according to the City’s geohazard mapping. The past ten years have shown that it is possible to build in the challenging geology of Glenwood Meadows, but also that buildings will fail when the conditions are not properly taken into account. Two recommendations for designing the foundations are made in the geotechnical report. Conditions of approval have been recommended to ensure safety and full mitigation from geologic hazards.**

(5) The project will not have a significant adverse effect on the capability of local governments affected by the project to provide local infrastructure and services, or exceed the capacity of service delivery systems. The determination of the effects on local government services and infrastructure may include but is not limited to the following considerations:

- a. Current and projected capacity of roads, schools, infrastructure, drainage and/or stormwater infrastructure, housing, recreational facilities, emergency services, and other services necessary to accommodate development, and the impact of the project upon the current and projected capacity.
- b. Changes caused by the project in the cost of providing education, transportation networks, water treatment and wastewater treatment, stormwater drainage, channel stabilization, recreation facilities, bridges, emergency services, or other governmental services or facilities.
- c. Need for temporary roads to access the project for construction and maintenance.
- d. Change in demand for public transportation.

**The project does challenge the City’s electric and road infrastructures. The proposed bus and car chargers, in particular, take significant capacity from the existing substation and transformers serving the area. Ultimately, without infrastructure upgrades with the project as proposed, the City would lose redundancy that has been planned for Glenwood’s grid system. However, there are infrastructure upgrades that will allow the project to proceed as proposed without detriment to the City’s grid. A condition of approval has been recommended that will establish a separate process for the Electric Department to take stock of its needs and to engage with RFTA in a fair cost-sharing agreement.**

**The traffic impact study provided by the applicants makes clear that there will be significant impacts to the road system from the additional traffic the project will generate, particularly to the western Wulfsohn Road/Midland Avenue intersection, the Devereux/Midland intersection, the roundabouts at I-70's exit 114, and the 9<sup>th</sup>/Grand intersection. A closer reading of the traffic impact study reveals, in the opinion of the City's Engineering and Public Works departments, that the provided traffic impact study has flaws that need correcting, which include not providing analysis for three intersections that are important to consider and discrepancies with the traffic counts. The City's Engineering Department has determined that a roundabout is the preferred option to enhance the Wulfsohn/Midland intersection functionality and has already engaged in preliminary designs for a roundabout at this intersection. This project makes the need for intersection improvements acute. A condition of approval has been recommended requiring RFTA update its traffic impact study and pay a share of the construction costs of the roundabout.**

(6) The project will not have a significant adverse effect on the quality or quantity of recreational opportunities and experience. The determination of effects of the project on recreational opportunities and experience may include but is not limited to the following considerations:

- a. Changes to existing and projected visitor days.
- b. Changes in quality and quantity of fisheries.
- c. Changes in instream flows or reservoir levels.
- d. Changes in access to recreational resources.
- e. Changes to quality and quantity of hiking, biking, or horseback riding trails.
- f. Changes to hunting experiences.
- g. Changes to open space.
- h. Changes to existing conservation easements.
- i. Changes to regional or neighborhood parks.
- j. Changes to recreational scenic experience.

**It is possible that the project will promote greater access to the Wulfsohn-area and Red Mountain trails through increased bus service to the site, which is located near the Wulfsohn trails. It is not believed that construction activities will interfere with trail users.**

(7) The project will not significantly degrade air quality. The determination of effects of the project on air quality may include but is not limited to the following considerations:

- a. Changes in visibility and microclimates.
- b. Applicable air quality standards.

**The project will enable more bus traffic, but the project also programs additional electrification of RFTA's bus system. Moreover, bus traffic, by its nature, is intended to reduce overall air pollution through removing more polluting vehicles from the roadways. It is believed that the proposal will not degrade air quality.**

- (8) The project will not significantly degrade existing visual quality. The determination of visual effects of the project may include but is not limited to the following considerations:
- a. Visual changes to ground cover and vegetation, waterfalls and streams, or other natural features.
  - b. Interference with viewsheds and scenic vistas.
  - c. Changes in landscape character types of unique land formations.
  - d. Compatibility of structure size and color with scenic vistas and view sheds.
  - e. Changes to open space.
  - f. Changes to existing conservation easements.
  - g. Changes to impacts to regional or neighborhood parks.

**The project will not significantly degrade the site's aesthetic qualities because the site is already developed and is surrounded by existing development.**

- (9) The project will not significantly degrade surface water quality. The determination of effects of the project on surface water quality may include, but is not limited to, the following considerations:
- a. Changes to existing water quality, including patterns of water circulation, temperature, conditions of the substrate, extent and persistence of suspended particulates and clarity, odor, color or taste of water.
  - b. Applicable narrative and numeric water quality standards.
  - c. Changes in point and nonpoint source pollution loads.
  - d. Increase in erosion.
  - e. Changes in sediment loading to waterbodies.
  - f. Changes in stream channel or shoreline stability.
  - g. Changes in stormwater runoff flows.
  - h. Changes in trophic status or in eutrophication rates in lakes and reservoirs.
  - i. Changes in the capacity or functioning of streams, lakes, or reservoirs.
  - j. Changes to the topography, natural drainage patterns, soil morphology and productivity, soil erosion potential, and floodplains.
  - k. Changes to stream sedimentation, geomorphology, and channel stability.

**Surface water runoff is designed to be captured through piping and underground chamber systems after being filtered through native and drought-resistant landscaping. The drainage report and stormwater plans need to be revised so as to consider the impact on the culvert underneath Midland Avenue and not overload it, causing it to fail. This has been recommended as a condition of approval.**

- (10) The project will not significantly degrade groundwater quality. The determination of effects of the project on groundwater quality may include, but is not limited to, the following considerations
- a. Changes in aquifer recharge rates, groundwater levels and aquifer capacity including seepage losses through aquifer boundaries and at aquifer-stream interfaces.
  - b. Changes in capacity and function of wells within the impact area.
  - c. Changes in quality of well water within the impact area.

**Groundwater quality will be protected by using the same practices as protecting surface water quality, including properly sized piping and conveyances, in addition to erosion prevention measures that will be required by building or grading permits.**

- (11) The project will not significantly degrade wetlands and riparian areas, terrestrial or aquatic plant or animal life.

**No large-scale wetland or riparian areas exist in the project's vicinity.**

- (12) The project will not significantly deteriorate soils and geologic conditions. The determination of effects of the project on soils and geologic conditions may include but is not limited to the following considerations:
- a. Loss of topsoil due to wind or water forces.
  - b. Changes in soil erodibility.
  - c. Physical or chemical soil deterioration.
  - d. Terrain deformation/mass wasting/subsidence.
  - e. Compacting, sealing and crusting.
  - f. Waterlogging.
  - g. Soil morphology and productivity.

**To avoid unwanted soil and geologic conditions such as erosion and soil compaction, all recommendations from the project's geotechnical experts must be followed and the geotechnical report must support all stormwater, civil, and structural designs. Conditions of approval have been recommended ensuring that this happens.**

- (13) The project will not cause a nuisance. The determination of nuisance effects of the project may include, but is not limited to, the following considerations: Increase in odors, dust, fumes, glare, heat, noise, vibration or artificial light.

**Potential sources of nuisances for this project after buildout would include lighting and noise from buses. The exterior lighting standards should mitigate this situation. Noise from buses will likely exist, though the site already experiences bus traffic at the existing transit stop. It is not anticipated that noise from buses will excessively contribute to a nuisance situation, given that the nearest residential development is approximately a quarter mile away.**

- (14) The project will not result in an unreasonable risk of releases of hazardous materials. The determination of the risk of release of hazardous materials caused by project may include but is not limited to the following considerations:
- a. Plans for compliance with federal and state handling, storage, disposal, and transportation requirements.
  - b. Use of waste minimization techniques.
  - c. Adequacy of spill prevention and response plans.



**No risk from hazardous material releases is anticipated.**

- (15) Urban development, population densities, and site layout and design of storm water and sanitation systems shall be accomplished in a manner that will prevent the pollution of aquifer recharge areas. The determination of potential for pollution of the aquifer recharge areas by the project may include but is not limited to the following considerations:
- a. Proximity of urban development and population densities to aquifer recharge areas.
  - b. Proximity of stormwater and sanitation systems to aquifer recharge areas.
  - c. Changes in water quality in the aquifer recharge areas.

**There are no known impacts to aquifer recharge zones.**

- (16) The project shall be reasonably necessary to meet projected community development and population demands in the areas to be served by the project, or to comply with regulatory or technological requirements. The determination of whether the project is reasonably necessary may include but is not limited to the following considerations:
- a. Relationship to reasonable growth projections and local land use plans.
  - b. Relationship to other providers' service areas.
  - c. Whether the project is not in compliance with regulatory or technological requirements or will not be in compliance in the near future.

**The project represents an expansion of RFTA's transit service and commitment to mass transit. The transit center will expand to nine bus bays, include bus charging infrastructure, include more amenities to riders, and include significantly more parking. A significant portion of Glenwood Springs's workforce commutes from outside the city, and vehicle traffic is a primary concern within the city. This project has the potential to reduce traffic and give commuters greater opportunities to take mass transit.**

- (17) The project shall be constructed in areas which will result in the proper utilization of existing facilities or systems to ensure the orderly and sustainable development of infrastructure in the City and adjacent communities, including the following considerations:
- a. Site selection and construction will not create or encourage growth and development which is incompatible with and cannot be accommodate by the local financial capacity of the area or residents to be served.
  - b. New systems will not overburden existing systems and current and future demand for services can be met within existing and proposed capacity.
  - c. The project will not create proliferation of special districts or overlapping of special districts with the boundaries of other special districts or municipalities.
  - d. The project is the best alternative for the provision of services to the geographical area serviced.
  - e. To the extent feasible, facilities and systems shall be consolidated with existing facilities and systems in the area.

- f. The project will not result in duplicative services or excessive capacity.
- g. The project will be administered so as to minimize disruption of utility services and preserve desirable existing community patterns.

**As discussed in the criterium addressing service delivery capacity, the project does represent challenges to both the road system and electric infrastructure. The site location is ideal for the expansion of transit services, but conditions of approval and separate agreements will be necessary for cost sharing of upgrades that will be needed to the road and electric systems.**

- (18) Economic impacts including, but not limited to, taxable property, licensed and permitted facilities, and recreation related to the proposed project have been identified and will be compensated for or mitigated.

The site has previously been used for governmental entities, so no economic detriment is anticipated with the proposal.

- (19) The project shall emphasize the most efficient use of water, including the recycling, reuse, and conservation of water, including the following considerations:

- a. Whether the project uses readily available conservation techniques.
- b. Whether the project recycles water to the greatest extent permissible.
- c. Whether the project will use raw water for exterior or irrigation use if available.

**The applicant team has identified that they will be using water efficient toilets and plumbing fixtures and will be using raw water for all irrigation. However, it is unclear if it will be possible to transport the raw water to the transit center site. The City's past experience with irrigation lines running underneath streets in Glenwood Meadows, as the applicants propose underneath Wulfsohn, has shown that this is a bad long-term idea and leads to street failures. A condition of approval has been recommended for the applicant to revise the plans removing the irrigation piping beneath Wulfsohn.**

### **Review Criteria Specific to Areas Around Key Facilities**

No permit shall issue for a project related to areas around designated key facilities in which development may have a material impact upon the key facility or surrounding community unless it contains conditions tailored to mitigate the environmental, infrastructure, and financial impacts to the City described in subsection (b) below. Conditional permits shall issue at the discretion of the Permit Authority, pursuant to 070.080.360.

Applications for a project related to areas around designated key facilities in which development may have a material impact upon the key facility or surrounding community shall be subject to the following mandatory special review criteria.

- 1) The project will encourage the smooth flow of motorized and nonmotorized traffic.
- 2) The project will foster the development of such areas in a manner calculated to preserve the

smooth flow of such traffic.

- 3) The project will preserve desirable existing community patterns.

**City Staff believes the project's design will have a satisfactory traffic flow internally, but without changes to the nearby Wulfsohn/Midland intersection, there will not be a smooth or safe traffic flow. City Staff has identified that a roundabout is the preferred solution to upgrade this intersection. Because RFTA will be contributing to the undesirable and unsafe condition of this intersection, the City has requested in a condition of approval that they pay a portion of the construction cost of a roundabout.**

#### **REVIEWING AGENCY COMMENTS**

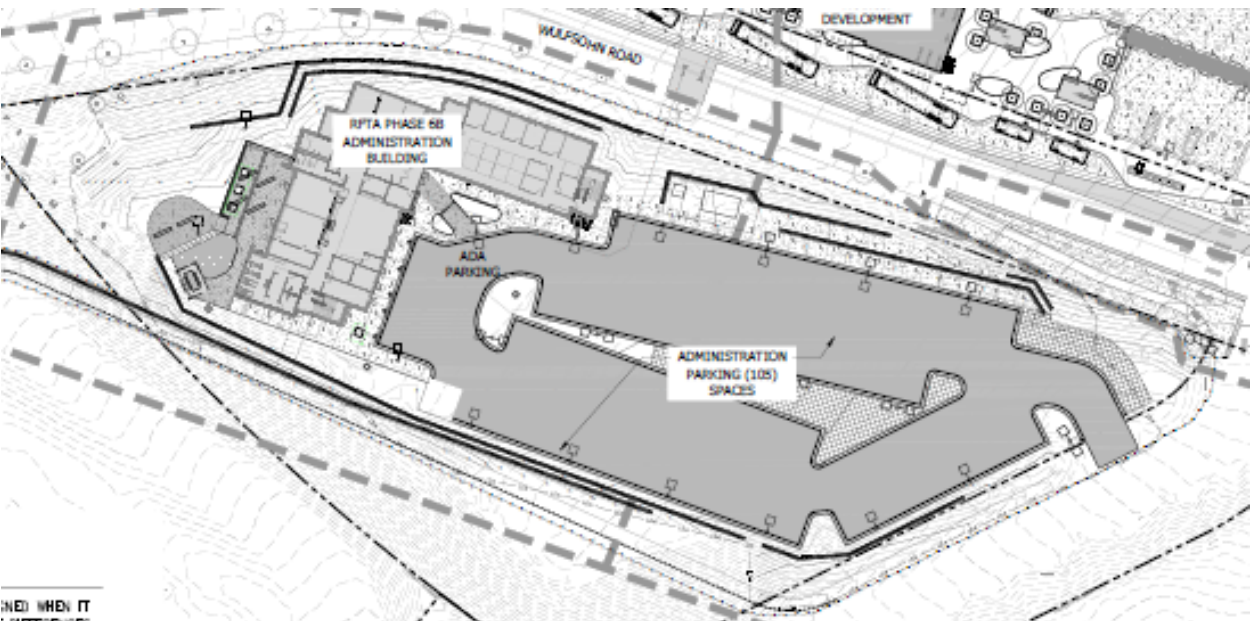
The City of Glenwood Springs referral agencies were forwarded application materials for the proposed transit center. The Engineering, Public Works, and Electrical Department comments are provided as attachments to this report. All comments have been incorporated as conditions of approval for the project.

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## **REVIEW CRITERIA AND STAFF ANALYSIS – LOCATION & EXTENT REVIEW**



Above: The green star represents the land parcel upon which the administration building is proposed.



Above: The overall site plan for the administration building site.

The Location & Extent Review component of this project, for the proposed administration building and maintenance building, has been reviewed against Title 070 of the Municipal Code, the zoning regulations. The Sensitive Area Protection Standards, section 070.040.020, apply to

the Location & Extent Review because of the presence of geohazards. This analysis, and the summary table below, is a summary of compliance with zoning standards for only the **administration building and maintenance building (Phase 6B and 8)**.

Summary of compliance with zoning standards for the **administration building (Phase 6B)**.

| <b><u>CODE STANDARD</u></b>          |                                                                       | <b><u>PROPOSED</u></b> | <b><u>REQUIREMENT</u></b><br><b><u>MET</u></b> |
|--------------------------------------|-----------------------------------------------------------------------|------------------------|------------------------------------------------|
| Common Open Space                    | 10%; 22,385 square feet                                               | Not provided           | Needs Confirmation                             |
| Landscape                            | 15%; 16,505 square feet                                               | 46,230 square feet     | YES                                            |
| Landscaping specific standards       |                                                                       |                        |                                                |
| Trees                                | 1 per 400 s.f. of required landscaped area; 42 trees                  | 68                     | YES                                            |
| Shrubs                               | 1 per 100 s.f. of required landscaped area; 166 required              | 154                    | NO                                             |
| Perennials                           | 1 per 50 s.f. of required landscaped area; 331 required               | Not provided           | NO                                             |
| Native and drought-resistant species | Native and drought tolerant species must account for 75% of plantings | 55%                    | NO                                             |
| Parking Area Landscaping             |                                                                       |                        |                                                |
| Surface Area Landscape               | 20% of total surface parking area                                     | Not provided           |                                                |
| Interior Landscape                   | 10 square feet of landscaping per parking space; 1,050 s.f.           | Not provided           |                                                |
| Streetscape Landscaping              |                                                                       |                        |                                                |
| Street Trees                         | 1 tree per 75 linear feet of street frontage; 10 required             | 8                      | NO                                             |
| Setback                              |                                                                       |                        |                                                |

|                 |                                    |                                    |     |
|-----------------|------------------------------------|------------------------------------|-----|
| Front           | 5' minimum, 25' maximum            | 12.5'                              | YES |
| Rear            | 7.5'                               | Not provided                       | YES |
| Side            | 5'                                 | N/A                                | N/A |
| Height          | 40'                                | 48'8" (with mechanical screening); | NO  |
| Parking         | 1 per 300 s.f.; 98 required        | 105                                | YES |
| Sidewalk        | 8 feet in width along Wulfsohn Rd. | 5'                                 | NO  |
| Bike Parking    | 9 bike parking spaces              | 12                                 | YES |
| Trash Enclosure | Must be enclosed                   | Enclosed                           | YES |

Summary of compliance with zoning standards for the **maintenance building (Phase 8)**.

| <b><u>CODE STANDARD</u></b> |                  | <b><u>PROPOSED</u></b> | <b><u>REQUIREMENT MET</u></b> |
|-----------------------------|------------------|------------------------|-------------------------------|
| Common Open Space           | 5%; 11,193 s.f.  | Not provided           | Needs clarification           |
| Setback                     |                  |                        |                               |
| Front                       | 20               | Not provided           | YES                           |
| Rear                        | 10               | Not provided           | YES                           |
| Side                        | 10               | Not provided           | YES                           |
| Height                      | 40'              | 19'4"                  | YES                           |
| Parking                     | None             | None                   | YES                           |
| Sidewalk                    | N/A              | None                   | N/A                           |
| Bike Parking                | None             | None                   | YES                           |
| Trash Enclosure             | Must be enclosed | N/A                    | N/A                           |

#### *Setbacks*

While not all the distances from building edges to property lines are provided, it is clear that both buildings meet minimum setbacks.

#### *Building height*

The proposed maintenance building meets maximum height requirements. The administration building exceeds maximum building height limits. The administration building has a maximum height of 48'8," which includes an approximately 30-foot segment of mechanical equipment



screening. The screening of mechanical equipment is allowed an additional five feet of height above the maximum height limit, but the proposal exceeds this allowance by more than three feet. Additional allowances exist in the Municipal Code for parapet walls, the tops of which may extend 2.5 feet above the height limit. The proposed design is broken up by sections of alternating heights. A condition of approval has been recommended requiring compliance with maximum building height, but with the possibility for allowed exceptions.

### *Building design and materials*

Sensitive Area Protection regulations, rather than nonresidential design standards, contain building design standards for areas with mapped geohazards. These design standards emphasize blending the design with natural terrain, requiring neutral and earth-toned hues on exterior building surfaces, roofs, and mechanical equipment. The proposal achieves this goal with its use of dark reds and browns. The brick and stone primary materials with metal accents meet the Sensitive Area Protection requirements materials that can withstand Glenwood's climate.



Above: Two renderings of the proposed administration building.

### *Landscaping*

The proposed landscaping plan for the administration building includes landscaping buffers around the building site and parking lot. While the plan programs more than enough landscaped area, it is still deficient in the number of street trees proposed and the percentage of the planting schedule that is native and drought-resistant species. Further information is also needed to determine compliance with the required number of perennial plantings and parking area landscaping requirements. A condition of approval has been recommended requiring compliance with landscaping standards.

The landscaping requirements apply only to the administration building, which will sit on a different land parcel from the maintenance building. The maintenance building does not add enough floor area to the parcel on which it sits, which contains other large buildings already, to trigger the need to provide a landscaping plan.

#### *Retaining walls*

The application materials show plans for retaining walls greater than the six feet allowed due to the very steep slopes on the site. A condition of approval has been recommended that the retaining walls be reduced in height as much as possible and include methods such as terracing and screening wherever feasible to reduce the visual impact of these walls. Any retaining wall over four feet in height requires engineered designs.

#### *Exterior lighting*

The photometric plan shows some portions of the parking area out of compliance with the maximum lighting levels. The mounting heights of exterior lights have not been provided. A condition of approval has been recommended that the lighting plans be revised to meet maximum mounting heights and reduce illumination levels in some areas.

#### *Comprehensive Plan compliance*

The project is in general compliance with the Comprehensive Plan. The administration building and maintenance building support the following goals, policies or actions:

- Serve as a leader in regional transportation and strengthen partnerships to pursue federal funding and to “regionalize” nonfederal funding commitments. Begin to budget transportation and capital improvement work programs and work with RFTA and others to leverage multi-modal opportunities (such as road/Bus Rapid Transit or road/rail) to fund and implement corridor routes for SH82, Railroad Corridor and South Bridge.
- Continue and strengthen partnerships between Federal, State, and Municipalities to build a more robust transportation system to serve the region such as Bustang, Pegasus, and RFTA.
- Develop and implement mitigation strategies to reduce the impact of regional growth on traffic congestion on major roads, highways, and residential streets.

### **REVIEWING AGENCY COMMENTS**

The City of Glenwood Springs referral agencies were forwarded application materials. The Engineering, Public Works, and Electrical Department comments are provided as attachments to this report. All comments have been incorporated as conditions of approval for the project.

### **ACTION ITEMS & STAFF RECOMMENDATIONS**



Staff recommends approval of the **1041 Review application** with the following suggested conditions:

**Recommended Conditions of Approval (1041 Review only):**

1. The development shall comply with the requirements of the Code. Any future physical changes or improvements to the property or buildings are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein and approved by the Community Development Director.
3. The applicant shall comply with recommendations identified in the technical reports submitted as part of the application including but not limited to geotechnical and drainage reports.
4. At the time of Final Plans Review submission, the plans shall be revised to include the following changes:
  - a. The transit center plans shall be amended to include offsets in the retaining walls of at least 12 inches every 50 feet.
  - b. Outdoor lighting fixtures shall not be mounted higher than 35 feet.
  - c. Update its traffic impact study to address the shortcomings identified by the Engineering Department.
  - d. The sidewalk along Wulfsohn Rd. adjacent to the transit center parcel shall be eight feet in width.
  - e. The stormwater detention plans, civil plans, and structural plans shall be revised in consultation with the geotechnical engineer to ensure compliance with the geotechnical report. The applicant shall provide a letter from the geotechnical engineer stating that the stormwater, civil, and structural designs of the transit center comply with the recommendations of the geotechnical report.
  - f. The drainage report and corresponding stormwater plans shall be revised to consider the impacts upon the culvert underneath Midland Avenue.
  - g. The plans shall be revised to remove irrigation piping underneath Wulfsohn Road.
  - h. The landscaping plans shall be revised to meet all City and Glenwood Meadows landscaping standards, including parking area landscaping, street trees, and minimum rates of native and drought-resistant species.
  - i. The transit center building shall be adjusted to meet front setback requirements or shall receive approval through the Municipal Code's flexibility procedures.
  - j. The architectural plans for the transit center building shall be revised to incorporate at least two design elements from section V.D.2.c of the GMADA.
  - k. The retaining walls shall be revised to include offsets of at least 12 inches every 50 feet of retaining wall.
  - l. Revise plans to include mounting heights of outdoor light fixtures that do not exceed 35 feet in height.
  - m. All plans shall demonstrate compliance with City referral comments.

- n. The portion of the retaining wall north of the parking area that is shown encroaching on a utility easement shall be adjusted so that it does not encroach on the utility easement.
- 5. Prior to submitting a building and/or grading permit application, the owner shall:
    - a. Submit and receive approval of a Final Plans application in accordance with Municipal Code section 070.060.050(c).
    - b. Submit an Engineer's Estimate of all public improvements and provide security for completing said improvements per requirements of the Engineering Standards.
    - c. Enter into a Development Agreement that memorializes the development approvals.
    - d. Provide all other permits from outside jurisdictions necessary for the project.
  - 6. Prior to issuance of the building permit, the applicant shall:
    - a. Provide evidence of approved and recorded land rights agreements with all involved property owners including the City of Glenwood Springs.
    - b. Obtain Right-of-Way Encroachment Licenses for all private uses or structures to be located within the right-of-way.
  - 7. Prior to issuance of the Certificate of Completion, owner shall provide as-built plans and an Improvement Survey Plat per the Engineering Standards.
  - 8. Before commencement of construction, RFTA shall contribute funding to the actual construction cost of a roundabout at the western Midland Avenue/Wulfsohn Road intersection in a percentage amount equal to the average of RFTA's share of peak hour traffic volume increase at the intersection at the opening of the transit center and RFTA's share of peak hour traffic volume increase after the total Meadows buildout. Total Meadows buildout shall mean completion of RFTA's Phase 6A, 6B, and 8, and the completion of the multifamily project at Glenwood Meadows Lots 11C-B and 11C-C, commonly referred to as "BLD."
  - 9. RFTA shall pay a fair share of the upgrades to electrical infrastructure that will be necessary to accommodate the project and future development in the City. This share shall be established by a separate agreement between the City and RFTA.

**Suggested Findings for the 1041 Review:**

- (1) The health, welfare, and safety of the residents of this City will be protected and served.
- (2) The project is in general conformance with the Comprehensive Plan and other duly adopted plans and permit criteria.
- (3) The project is financially feasible.
- (4) The project is not subject to significant risk from natural hazards.

(5) The project will not have a significant adverse effect on the capability of local governments affected by the project to provide local infrastructure and services, or exceed the capacity of service delivery systems.

(6) The project will not have a significant adverse effect on the quality or quantity of recreational opportunities and experience.

(7) The project will not significantly degrade air quality.

(8) The project will not significantly degrade existing visual quality.

(9) The project will not significantly degrade surface water quality.

(10) The project will not significantly degrade groundwater quality.

(11) The project will not significantly degrade wetlands and riparian areas, terrestrial or aquatic plant or animal life.

(12) The project will not significantly deteriorate soils and geologic conditions.

(13) The project will not cause a nuisance.

(14) The project will not result in unreasonable risk of releases of hazardous materials.

(15) Urban development, population densities, and site layout and design of storm water and sanitation systems shall be accomplished in a manner that will prevent the pollution of aquifer recharge areas.

(16) The project shall be reasonably necessary to meet projected community development and population demands in the areas to be served by the project, or to comply with regulatory or technological requirements.

(17) The project shall be constructed in areas which will result in the proper utilization of existing facilities or systems to ensure the orderly and sustainable development of infrastructure in the City and adjacent communities.

(18) Economic impacts including, but not limited to, taxable property, licensed and permitted facilities, and recreation related to the proposed project have been identified and will be compensated for or mitigated.

(19) The project emphasizes the most efficient use of water, including the recycling, reuse, and conservation of water.

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#### **LOCATION & EXTENT CRITERIA OF APPROVAL**

Per section 070.060.050 of the Municipal Code:

In reviewing a proposed Location and Extent application, the Planning Commission shall consider whether or not the proposed location and extent:

- i. Is consistent with the Comprehensive Plan and other City plans and policies;
- ii. Is consistent with the general purpose and intent of this Code; and
- iii. Minimizes adverse impacts to the health, safety, and welfare of the inhabitants of the surrounding areas and the city.

With the conditions of approval recommended in this report, Staff believes that these three criteria are met for the administration building and maintenance building.

Staff recommends approval of the **Location & Extent application** with the following suggested conditions:

**Recommended Conditions of Approval for Location & Extent Review:**

1. The development shall comply with the requirements of the Code. Any future physical changes or improvements to the property or buildings are subject to the review and approval of the Community Development Director for compliance with applicable requirements of the Glenwood Springs Municipal Code.
2. The applicant shall comply with all verbal representations made in the public hearings, as outlined in all application materials, and/or as revised per conditions herein and approved by the Community Development Director.
3. The applicant shall comply with recommendations identified in the technical reports submitted as part of the application including but not limited to geotechnical and drainage reports.
4. Prior to building permit review, the plans shall be revised to include the following changes:
  - a. Show required common open space and calculate its percentage of the administration building parcel.
  - b. Revise landscaping plan showing compliance with landscaping standards, streetscape standards, and parking area landscaping standards.
  - c. Provide mounting heights of outdoor light fixtures that do not exceed 35 feet in height.
  - d. Revise outdoor lighting plan to reduce estimated illumination levels to within allowed levels.
  - e. Reduce height of retaining walls to allowed limits and include methods such as terracing and screening wherever feasible to reduce the visual impact of these walls.
  - f. Add sidewalk width along Wulfsohn Rd. to plans. The minimum width shall be eight feet.
  - g. Revise administration building plans to comply with code requirements for maximum height.
  - h. A fire hydrant shall be installed on a landscaping island near the administration building.

- i. The stormwater detention plans, civil plans, and structural plans shall be revised in consultation with the geotechnical engineer to ensure compliance with the geotechnical report. The applicant shall provide a letter from the geotechnical engineer stating that the stormwater, civil, and structural designs of the transit center comply with the recommendations of the geotechnical report.
5. The drainage report and corresponding stormwater plans shall be revised to consider the impacts upon the culvert underneath Midland Avenue.
6. Prior to submitting a building and/or grading permit application, the owner shall:
  - a. Submit an Engineer's Estimate of all public improvements and provide security for completing said improvements per requirements of the Engineering Standards.
  - b. Provide all other permits from outside jurisdictions necessary for the project.
7. Prior to approval of a building permit, the Minor Subdivision Plat of Glenwood Springs Municipal Operations Center shall be amended and recorded removing all easements that conflict with the proposed maintenance building, if any conflict.
8. Prior to issuance of the Certificate of Completion, owner shall provide as-built plans and an Improvement Survey Plat per the Engineering Standards.
9. Before commencement of construction, RFTA shall contribute funding to the actual construction cost of a roundabout at the western Midland Avenue/Wulfsohn Road intersection in a percentage amount equal to the average of RFTA's share of peak hour traffic volume increase at the intersection at the opening of the transit center and RFTA's share of peak hour traffic volume increase after the total Meadows buildout. Total Meadows buildout shall mean completion of RFTA's Phase 6A, 6B, and 8, and the completion of the multifamily project at Glenwood Meadows Lots 11C-B and 11C-C, commonly referred to as "BLD."
10. RFTA shall pay a fair share of the upgrades to electrical infrastructure that will be necessary to accommodate the project and future development in the City. This share shall be established by a separate agreement between the City and RFTA.

**Suggested Findings for Location & Extent Review:**

- (1) The project is consistent with the Comprehensive Plan;
- (2) The project is consistent with the general purpose and intent of the Municipal Code; and
- (3) The project minimizes adverse impacts to the health, safety, and welfare of the inhabitants of the surrounding areas and the city.

MINUTES  
CITY OF GLENWOOD SPRINGS  
Planning and Zoning Commission

Regular Meeting  
December 17, 2024  
Council Chambers, First Floor  
101 W. 8TH STREET 6:00 PM

**1. Roll Call**

Present: Commissioners: Carolyn Cipperly, Amy Connerton, Pete Waller, John Houghton, Gregory Cowan, Connie Geiman

Also Present: Community Development Director Hannah Klausman, Senior Planner Watkins Fulk-Gray, Senior Planner Emery Ellingson, City Attorney Richard Peterson-Cremer

**2. Conflicts of Interest**

None

**3. Receipt of Minutes**

No minutes were received.

**4. Comments from citizens for items not appearing on the agenda**

No public comment was offered.

**5. New Items**

**a. Planning File 36-24 Residential Minor Site and Architectural Plan and Planning File #34-24 Preliminary Plat 619 Overlin Drive**

Planner Emery Ellingson presented Action Item 1: Planning File 36-24 Residential Minor Site and Architectural Plan and Action Item 1: Planning File #34-24 Preliminary Plat 614 Overlin Drive.

Staff recommend approval with findings and conditions in the staff report.

Commissioner questions, comments, and staff responses included the following:

- How will the neighboring property's driveway and access be affected? **Staff response:** Staff provided explained that there would be approximately 12' remaining for the access

of the neighboring property which was sufficient for a driveway. Staff also indicated that applicant was open to working with neighbor on what final access would look like.

- Question regarding removal of live vegetation. **Staff response:** Staff provided explained that removal of any living tree with caliper of greater than 14" would require approval by Community Development Director and Parks and Recreation Director.
- Question regarding building height. **Staff response:** Staff confirmed proposed heights of buildings were 25' and 32', both of which are within height limits of the RH Residential High Density Zoning District.
- Question regarding height transition requirements. **Staff response:** Staff explained the four methods for meeting height requirements and indicated that meeting this requirement was a condition of approval and that the applicant was actively working with staff to provide a design solution.
- Question regarding screening of transformer from public right of way. **Staff response:** Staff confirmed that if the transformer were to remain in the proposed location then the transformer would need to be screened with landscaping.
- How long has the area had been zoned as high-density residential zoning? **Staff response:** Staff explained that area had been zoned as high-density since at least 1998 and that existing multi-family buildings constructed in the 1970s seem to indicate the area has been zoned as high density residential for some time.
- Question regarding sidewalk fee-in-lieu option and sidewalk requirements. **Staff response:** Staff explained that Engineering preferred the sidewalk fee-in-lieu option because planning is underway for pedestrian improvements in the area.
- Question on clarification on when height transition is required and if distance from neighboring property had affect on requirement. **Staff response:** Staff explained that requirement is for adjacent properties and that distance from a smaller structure was not a factor in applying the design requirement.
- Question on how many existing multi-family developments currently exist in the neighborhood. **Staff response:** Staff did not have specific number of multi-family properties and provided broad description of neighborhood. Staff also pointed out the neighborhood was a mix of densities.
- Question on sound transmission assembly requirements for the project. **Staff response:** Staff clarified that sound transmission requirements of the International Residential Code would not apply to this project as the City has not adopted Appendix AK of the International Residential Code.
- Question on traffic study and how the numbers were calculated and if Engineering had reviewed and approved the findings **Staff response:** Staff confirmed that Engineering had reviewed and approved the findings of the traffic study and that the proposed volumes did not trigger any improvements per the City's current Engineering Standards.
- Questions on parking lot illumination. **Staff response:** Staff confirmed that the proposed lighting plan did not meet minimum requirements of Lighting District 2 and that a condition of approval was to revise the lighting plan to meeting the minimum parking lot illumination standards.

- Will the units be modular units? **Staff response:** Staff explained that applicant had indicated the homes were to be modular and that the applicant could confirm whether homes to be modular or stick built.

### **Applicant Comment:**

Applicants Ben West, Glenwood Springs and Roger Giard, Carbondale made a short presentation on the proposed development.

Commissioner questions, comments, and applicant responses included the following:

- Questions on common open space requirement and the areas indicated on the plan and what amenities would be offered in the common open space. **Applicant response:** Applicant explained that the common open spaces would have added amenities that would meet the requirements, most likely benches or garden areas that would provide passive recreation opportunities as opposed to active recreation such as playground equipment. Applicant explained that the square footage would be provided with exact details included later. Applicant also indicated that they had been working on some design revisions specific to this requirement.
- Questions on if eleven units were needed to make the project profitable and if applicant had considered removing a unit to obtain full amount of common open space without a fee-in-lieu. **Applicant response:** Applicant discussed trade off in eliminating a unit and benefits of an additional housing unit versus the amount of open space. Applicant also confirmed that they believed they could achieve the open space with the proposed site plan.
- Questions how parking would be managed and how it would meet parking demands of the development. **Applicant response:** Applicant confirmed they were meeting minimum parking requirements for development per standards of the Code. They also discussed that parking management could be addressed with the HOA. Applicant acknowledged that parking is a concern in the neighborhood and that there could be assigned parking within the property for the units.
- Questions if the development would be modular or stick built. **Applicant response:** Applicant explained that initial idea was to utilize modular housing but that after further review, applicant has decided to stick build the proposed buildings.
- Questions if applicant had made considerations for sound transmission between the units to minimize noise from railroad and neighboring units. **Applicant response:** Applicant explained that they have considered sound transmission and that the constructed units would have some form of sound protection in the construction.
- Questions on common open space requirements and if it needed to be passive or active. **Applicant response:** Staff confirmed that the area could be open to passive recreation and/or active.



- Questions on public noticing and notes from pre-neighborhood application meeting. Specifically, asking why the minutes from the pre-application meeting read that there were 26 parking spaces. Additional question on placement of public notice sign.  
**Applicant response:** Applicant explained that this was a typo in the minutes and that the proposed site plan which was shared with the neighborhood showed 20 parking spaces as required by Code. Applicant also explained that public noticing items which were done as required.

Commissioner Waller opened the item to public comment. Following members of the public provided comment:

Laurie Chase, Glenwood Springs provided comment on the following:

- Public notices not reaching the entire neighborhood
- Concerns for overflow parking and the City's current parking requirement of 1.5 spaces per unit not being sufficient.
- Concerns for increase in traffic to 8th Street, adding traffic to connection to Midland, and speed of traffic through the neighborhood.

Jim Richmond, Glenwood Springs provided comment on the following:

- Traffic and safety concerns regarding lack of pedestrian improvements in the neighborhood and increase in traffic from the neighborhood.

Gary Vick, Glenwood Springs provided comment on the following:

- Public notices not reaching the entire neighborhood, beyond the 300' required.
- Concerns for parking and its effect on the neighborhood, particularly the current requirement for 1.5 spaces per unit as opposed to 2 spaces per unit.

Commissioner Waller closed the item for public comment.

Commissioner Connerton made a motion to approve Action Item 1 for Planning File #36-24 Residential Minor Site and Architectural Plan. Commissioner Cipperly seconded the motion.

Discussion after the motion included:

- Discussion of parking demands upon the neighborhood, Code requirements for parking, and management of the on-site parking spaces.
- Common open space requirements and the common open space fee-in-lieu
- How the applicant will meet the height transition design requirement on the east side of Building B.
- Clarification that approval of the Site and Architectural Plan was not approving any variances and that recommending conditions of approval for height transition, common open space, parking lot lighting, and landscaping did not constitute variance approvals.
- Inclusionary zoning requirements for the project

- Snow storage

Staff also provided additional information related to items discussed.

Roger Giard, Applicant explained to the Commission that the 26 parking spaces in the minutes was a typo and that 20 spaces was the amount described at the pre-application neighborhood meeting.

Commissioner Waller called the item to question. Motion passed unanimously with a vote of 6-0.

Commissioner Cipperly motioned for approval of Action Item 1 for Planning File #34-24 Preliminary Plat with conditions described in the staff report. Commissioner Connerton seconded the motion.

Commissioner Waller called the item to question. Motion passed unanimously with a vote of 6-0.

#### **b. Planning File 21-24, Location & Extent Review and 1041 Review for Roaring Fork Transportation Authority (RFTA)**

Planner Watkins Fulk-Gray presented both action items, a Location & Extent Review and 1041 Review, for RFTA at 2302 and 2307 Wulfsohn Rd.

Staff recommends approval with findings and conditions in the staff report.

Commissioner questions, comments, and staff responses included the following:

- Clarification requested about a statement in the staff report that said “sidewalk width not provided.” **Staff response:** Fulk-Gray explained that the application materials did not state the width, but that it is required to be eight feet, and may currently meet code, but verification and detail is needed.
- Question how water would be delivered to the site. **Staff response:** RFTA will do the construction to get the water line to the site and then the City will take it over.
- How will pedestrian circulation work at the roundabout discussed for Wulfsohn and Midland. **Staff response:** The roundabout has not been designed yet, so many details are not known. Roundabouts are not ideal for pedestrians, but they can work and the City will make it work.
- Will the location of the current park’n’ride be the same location as the proposed one? **Staff response:** The new one will be much expanded but it is the same location.
- Will it be possible to make the landscaping compliant? **Staff response:** This will be a better question for the applicant. It should be possible meet most landscaping requirements, but the street trees may be challenging given the length of the bus platforms.
- Question about what the current construction project is near the site. **Staff response:** A new maintenance facility, bus barn, and fuel and wash are under construction or have been recently completed.

- Why are street trees required? **Staff response:** The City requires that 75% of all new plantings be native and drought resistant, and these plants, once they are established, can live on just the rainfall we get. The purpose of having street trees is for aesthetic reasons and to create a good environment for pedestrians.
- Question about the exterior lighting being out of compliance. **Staff response:** The conditions of approval require the lighting plan to be brought into compliance.
- Question about the GMADA. **Staff response:** It is similar to a PUD in that it is a separate set of zoning regulations, with City zoning as its base. It is an annexation and development agreement, and appended to it are zoning and design standards.
- Is this project the reason for needing to do electric system upgrades and the roundabout at the intersection. **Staff response:** The electric load is higher than the City believed it would be, so the peak load may increase 25% or 30% at worst case scenario. The infrastructure may need to be upgraded more than anticipated. The City has been looking at the Wulfsohn/Midland intersection for a year and a half and looked at other options such as signals, and landed on a double-lane roundabout. There is limited sight distance looking down the hill, so a roundabout is a safer situation. A full design is planned to happen next year. About \$2M to \$3M is budgeted in 2026 for the project.
- How close is the new transit center to the new large apartment buildings under construction? **Staff response:** About a quarter mile away.

#### Applicant Comments:

The applicant representative from RFTA, Ben Ludlow, introduced himself. The project has received federal grant funding. He displayed an overall site plan of RFTA's buildings and gave an overview of recent development, then displayed the current site plan for the transit center. He said they planned to move the We-Cycle station out of the right-of-way. He then displayed the site plan for the administration building and described its layout. The maintenance building, which is actually to be for parts storage, is next to the very large retaining wall.

Mr. Ludlow said the lighting plans meet or exceed Glenwood's lighting standards, though they do still receive complaints from residents. He said the priority is safety for employees and passengers, but that they will meet the lighting standards in the places where the photometric plans do not meet it.

He noted that RFTA does not have to follow the Location & Extent conditions of approval, but they prefer to follow them. Mr. Ludlow said the current proposal will not exceed the City's current capacity.

While not arguing that the intersection does not need a roundabout or improvements, Mr. Ludlow said that the transit center parcel falls within an exception that exempts them from having to contribute to the intersection improvements. He said that RFTA would resubmit their traffic study to accurately reflect their now-current RFTA buildout. He said he does not agree with the suggested condition of approval requiring RFTA to contribute toward funding the roundabout; however, he encouraged the City to come to the RFTA board to discuss participation.

Mr. Ludlow said that the tall retaining walls in phase 6B will not be visible behind their building. He said it will be very difficult to meet the street tree requirements given the needs of buses.

Comments to Applicant from Commissioners:

Question about the difference in current and proposed parking, and whether any alternative shading methods have been considered. Is overnight parking for Bustang users allowed?

**Applicant response:** Mr. Ludlow said that introducing water to this area is not something they want to do because of soil conditions. They prefer to not include plantings with their landscaping islands. There are mini shade structures in the waiting area. Doing solar on this site is not feasible because of the lack of sunlight. Geothermal is one green energy source they have considered at this site. The new project would add about 20 spaces. Parking is limited to 24 hours, and there are designated Bustang parking spaces.

Question about parking for trailers and overnight camping. **Applicant response:** No trailer parking is contemplated. The indoor waiting area will be open most of the day but not 24 hours.

Will this project cause any changes to the bus routes and if the electric buses will begin to serve more of the valley? **Applicant response:** More BRT service will be served at this location will be possible. It is difficult to use electric buses for longer routes, so right now the plan is not to run electric buses between Aspen and Glenwood.

Will Glenwood become RFTA's headquarters. **Applicant response:** RFTA has offices in many locations, and their goal is to get every department in one location.

How many employees would work out of the administration building and how many EV parking spots are at the park'n'ride and administration building? **Applicant response:** It is not known how many employees will work there. Two EV parking spaces will be roughed in at the park'n'ride and two at the administration building. They will not be installed until they receive future grant funding.

Does their grant funding include funding for the roundabout. **Applicant response:** No, only site work at the buildings.

Is the project fully funded and question about the timeline for the three phases. **Applicant response:** A Low/No Emission Grant and RAISE Grant and small DOLA grant are all in place. They hope to bid the project in the spring and start construction. Ideally, the project will be done in 2027.

What community amenities are to be provided? **Staff response:** A minimum "community amenity" area is required, but Staff considers that the shade structures and waiting area amenities can count for this.

What is the area of the snowmelt? **Applicant response:** I do not know, but the snowmelt system involves just a boiler.

Compliment of the 27<sup>th</sup> St. Station and question about if there is any possibility in the future for adding parking at the Phase 6A site. **Applicant response:** Mr. Ludlow said theoretically it is possible to convert the planned parking to structured parking.

Will motion sensor lighting be incorporated in the parking area. **Applicant response:** Yes, RFTA does this everywhere.

Comments from Assistant City Attorney Richard Peterson-Cremer

The applicant made Staff aware this morning of his position that the ADA exempts RFTA from having to contribute to the roundabout construction. He clarified that contributions to the roundabout are an “exaction,” not a “fee,” as the language of the ADA uses. The applicant made a request to remove the requirement to contribute to roundabout costs, and if this is so, he recommends continuing the items tonight. Fulk-Gray clarified that contribution to the project is a recommended condition of approval for both the Location & Extent and 1041 Review.

Mr. Langhorst said he has not provided a Can and Will Serve letter for electric service, so they could handle that by not providing service. Both of these projects will impact traffic and electric service beyond their respective lots. He said that an updated traffic report is needed.

In response to a question from Chair Waller about how to proceed, Mr. Peterson-Cremer recommended asking for any clarifications of the applicant now.

Mr. Ludlow said that the 1041 Review should not include the condition of approval requiring contribution to the roundabout project. Location & Extent conditions of approval do not have to be followed, but RFTA always tries to comply with them.

Mr. Peterson-Cremer reiterated his recommendation of continuing both the action items after opening public comment. He has not had any dialog with RFTA's counsel yet. Mr. Ludlow said he prefers approval tonight of the Location & Extent Review.

Commissioner Geiman asked for clarification for why RFTA could ignore Location & Extent conditions of approval. Mr. Peterson-Cremer explained that this process is based on state law, like 1041 Reviews, but 1041 Reviews have much more stringent regulations. Location & Extent conditions of approval can be overridden by the applicant's board, whereas 1041 Reviews cannot be.

Mr. Ludlow confirmed landscaping and roundabout contribution conditions are the only ones that have caused concern.

Comments from the Public

- No public was in attendance.

Commissioner Connerton asked if they have to make a motion to continue the items. Mr. Peterson-Cremer said that yes, and both items can be continued with one motion.

Commissioner Connerton made a motion to continue Action Items 1 and 2 to January 28, 2025. Commissioner Cowan seconded the motion. Motion passed unanimously with a vote of 6-0.

Commissioner Waller called the item to question. Motion passed unanimously with a vote of 6-0.

## **6. Commissioner Comments**

Commissioner Haughton said he is surprised that the most recent FEMA flood map is from 1985. Mr. Langhorst said all of Garfield County is undergoing floodplain review, but it takes a long time to change these maps and they are not finalized.

Commissioner Geiman said the parking standards are too low and not realistic. Ms. Klausman said that the parking standards were thoroughly reviewed in 2018 and are middle-of-the-pack compared to other cities. Parking is a tricky balance because of the need to provide parking for people's cars but also not creating parking lots everywhere. Some communities are abolishing parking minimums altogether. Mr. Peterson-Cremer noted that the State legislature considered has considered abolishing parking minimums for multifamily development.

Chair Waller thanked Staff. He suggested that a training for P&Z in March might be a good idea. He asked about the status of the City's new permitting system. Ms. Klausman described the purpose of having an electronic permitting system that will go live at the end of February.

## **7. Director Comments**

Community Development Director Hannah Klausman said that RFTA will be on the January agenda and there could be additional items.

## **8. Adjournment**

Meeting adjourned at 9:30 PM.

**MINUTES**  
**CITY OF GLENWOOD SPRINGS**  
**Planning and Zoning Commission**

Regular Meeting  
January 28, 2025  
Council Chambers, First Floor  
101 W. 8TH STREET 6:00 PM

**1. Roll Call**

Present: Commissioners: Joy White, Amy Connerton, Pete Waller, John Houghton, Gregory Cowan, Connie Geiman

Also Present: Community Development Director Hannah Klausman, Senior Planner Watkins Fulk-Gray, City Attorney Karl Hanlon.

**2. Conflicts of Interest**

None

**3. Receipt of Minutes**

Connerton moved to approve. Cowan seconded. White abstained. Unanimously approved.

**4. Comments from citizens for items not appearing on the agenda**

No public comment was offered.

**5. Continued Items**

**a. Planning File 21-24, Location & Extent Review and 1041 Review for Roaring Fork Transportation Authority (RFTA)**

Senior Planner Watkins Fulk Gray presented an update on the continued item for RFTA's new transit center, administration center, and maintenance building. He explained that the City has received a revised traffic report and reached confirmation on questions related to process of the 1041 application.

Some conditions of approval were modified. Roundabout for Wulfsohn and Midland intersection only applies to the 1041 review and not those phases reviewed under Location and Extent. Some transit center-specific conditions were moved to the Location & Extent section.

The City has received more information from our electrical consultants regarding our electric load. The results showed that the current electric load needs of the project fit within the City's current capacity and any future expansion of load will need to be reviewed and agreed upon at that time.

The traffic report condition was removed because it has been completed. The irrigation piping condition was removed because the City and RFTA came to an agreement on it. A new condition about road improvements has been included.

Staff recommend approval with conditions with findings in the staff report.

Commissioner questions, comments, and staff responses included the following:

- Why did some of the conditions move from the 1041 application process to the Location Extent process? **Staff response:** The Transit Center itself is the key component of the 1041 process. Items such as landscaping and parking lot design are not what makes the transit center, so have been moved to the L&E's conditions of approvals.
- ROW licensing questions. **Staff response:** ROW Encroachments are fairly typical and they are approved by City Council at a public hearing.
- Percentage of improvements to the roundabout and where is that based from? **Staff response:** It comes from the revised traffic report submitted by RFTA.
- Question on managing the irrigation underneath Wulfsohn. **Staff response:** The irrigation line would be underneath the street, the City is proposing taking control of that line to avoid complication seen elsewhere in the Meadows.
- Staggering of retaining walls, is that for an aesthetic purpose. **Staff response:** Mostly an aesthetic breaking up of expansive walls and is a regulation of the Meadows Zoning and Development Plan.
- Questions related to the height of retaining walls for the Location and Extent. **Staff response:** At the highest point, they are close to 11 feet. The reason for the condition is to acknowledge the steep slopes and tricky slopes and requesting they bring them down as much as possible.
- Does the staff recommend roundabout contributions to both 1041 and Location and Extent applications? **Staff response:** Only to the 1041 application. City Attorney Hanlon explained that the regulatory authority only exists within the 1041 application.
- Are building heights as proposed meeting regulations for the administrative building. **Staff response:** The admin building is about 48 feet tall and the limit is 40 feet. There are some allowances for screening, which this project does not quite fall into.
- Road improvements are only where the road is being disturbed or where the buses are stopping or making turning movements correct? **Staff response:** Yes.
- Questions on which applications are P&Z authority and which are Council authority. **Staff response:** Location and Extent is P&Z authority, and 1041 is Council authority.

**Applicant Comment:**



Applicant Ben Ludlow, RFTA Interim Capital Projects Manager made a short presentation on the proposed development. Dave Pesnichak, Chief Operating Officer RFTA, is also present.

Irrigation line under Wulfsohn is the raw water line owned by the City. That is what RFTA will use for an extension to the Administration building.

All ROW encroachments have been removed.

L&E for Admin Building, height has been corrected at 39 feet, mechanical screening is 41 feet so is no longer an issue.

Retaining walls are behind the building and not visible from the ROW. Building into the hillside requires higher walls and we want the 11 feet as shown.

Every 8 spaces requires a landscape island in the GMZDP for the transit center. RFTA would like flexibility there.

RFTA will be rebuilding Wulfsohn correctly to City specifications.

Condition 4a, 12 inches every 50 feet (GMZDP) RFTA would like to exceed the requirement on the north wall along Wulfsohn which is against the sewer force main, exceed the height requirement and forgo the 12-inch stepback.

5b on L&E, flexibility requested on street trees every 40 feet.

Louis Wilsher, Architect for RFTA. Showed street trees. Explained about sight distance requirements preventing more trees, RFTA wants to keep a 10 foot clear zone for stacking. RFTA is putting trees where possible. Trees that are included on the platform are numerous but do not meet the "Street Tree" definition of being within a planting strip.

Proposed condition for the roundabout based on 1.68% based on peak traffic in the Traffic Impact Study. RFTA is okay with finalizing that condition with Council from the more generic condition as listed for P&Z.

Commissioner questions, comments, and applicant responses included the following:

- Question on timeline for the project and construction. **Applicant response:** Applicant explained that in a perfect world the project would start in summer of 2025, but that is subject to grants and funding that is tied to federal funding. 3<sup>rd</sup> quarter of 2027 is initial schedule for completion.
- Question on rate of disturbance and if it will be happening all at the same time. **Applicant response:** Applicant explained that the plans indicate the limits of

disturbance. RFTA will be doing the transit center site and the admin building site at the same time so that will be the disturbance areas occurring at the same time.

- Question on semi-trucks getting hung up on roundabouts, and whether the buses will do the same. **Applicant response:** Applicant explained that buses don't have the same issue.
- Question on how the project will impact the Bustang and other services that occur at the transit location currently. **Applicant response:** Applicant explained that RFTA is setting up alternative sites for that temporarily.
- Question on how the parking lot is going to look without any trees or islands. **Applicant response:** There are some trees provided to break up the parking lot next to the stairways.
- Will the trees near Wulfsohn be in planters? **Applicant response:** No, those are standard street trees in the ground. The trees in the parking lot are landscaped islands so not planters. The raised planters are on the platform itself.
- Electrical upgrade changes. **Applicant response:** City Attorney explained that the timing of the buildout of the whole system will require possible future impacts and be addressed at that time.
- Is RFTA redoing all of Wulfsohn Rd or what section is being redone? **Applicant response:** Alex Jauch, Engineer for project illustrated the sections of the park and ride and turning areas that will be disturbed and then rebuilt to City standards. Adding turn lanes in various locations which will include replacement.
- Question on partial replacements and RFTA working with the City to make sure Wulfsohn Rd is built to standards. **Staff response:** The City and RFTA are working together on this to make sure that all sections RFTA is needing to repair are full repairs built to the specifications indicated by the City.

Commissioner Waller opened the item to public comment.

No public comment received.

Commissioner Waller closed the item for public comment.

Commissioner Connerton made a motion to approve action item 1, 1041 Application with findings and conditions included in the staff report. Commissioner Cowan seconded the motion.

- Staff pointed out that the offsets of the retaining wall is condition 4A in the 1041 conditions and explained that P&Z could amend the motion if they are okay with that.

Amendment to motion by Connerton to exclude condition 4A from the 1041 application and move to the L&E application. Commissioner Cowan seconds the amendment.

Discussion after the motion included: No further discussion.

**Commissioner Waller called the item to question. Motion passed unanimously with a vote of 6-0.**

Commissioner Connerton made a motion to approve action item 2, Location and Extent Application with findings and conditions included in the staff report with flexibility on condition 4b, street trees, and 5b parking lot landscaping for the transit center, 4a,e and 5a on the Location and Extension for retaining wall offsets. Commissioner Geiman seconded the motion

Discussion: Clarification on the retaining walls and where flexibility is being applied to height as well as offsets. Confirmed by staff.

Clarification on 4g, RFTA mentioned that they made changes to their building height so is this still necessary. Staff response: recommend keeping it.

**Commissioner Waller called the item to question. Motion passed unanimously with a vote of 6-0.**

# TRAFFIC IMPACT STUDY

## RFTA GMF PHASE 6A BUILDOUT



Prepared by



DAN COKLEY, PE, PTOE  
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1/7/2025

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## 1.0 Introduction

This traffic impact study is prepared using the guidelines of a Colorado Department of Transportation (CDOT) Level Three Traffic Impact Study (TIS) and will satisfy City of Glenwood Springs Engineering Standards Chapter 5.11 Traffic Impact Analysis Standards. This TIS provides an estimate for design hour traffic generation for the RFTA Glenwood Maintenance Facility (GMF) and adjacent Park and Ride lot proposed expansion which is planned to occur in phases.

This RFTA Phase 6A TIS updates the RFTA GMF Ultimate Buildout TIS dated September 20, 2023, also prepared by SGM and results from changes in the proposed land use while also addressing review comments associated with that TIS received from the City of Glenwood Springs, Watkins Fulk-Gray via email December 10, 2024. The methodology and basis for this study is generally consistent with the September 2023 TIS as reiterated herein.

The City has provided the Glenwood Meadows Master Traffic Study (GMMTS) prepared by Kimley-Horn (K-H) and dated January 2023. The GMMTS provides a comprehensive overview of the entire Meadows area, from the I-70 #114 interchange on the northwest to Midland Ave. and 8<sup>th</sup> Street and downtown to Grand Ave. and reviews 2022, 2030, and 2040 scenarios that include the overall Glenwood Meadows projected development and consideration of increased background traffic. The GMMTS included the development of the RFTA GMF and Park and Ride (Zone 5) in those scenarios based on RFTA programming obtained from the RFTA Regional Transit Center (RTC) Traffic Analysis prepared by Shrewsberry for RFTA dated March 2018. This TIS provides updated projections for the RFTA ultimate buildout scenario and substitutes the “Zone 5” 2018 RFTA traffic projections in the GMMT for the RFTA ultimate buildout traffic projections developed in this study.

The purpose of this study is to simulate the 2023 Baseline operational conditions from the GMMTS and provide the trip generation, distribution, and traffic assignment for the RFTA Phase 6A buildout programming. It will provide an analysis of the study intersections for safety and operational impacts.

The roadway network and study area are depicted in Figure 1. The existing RFTA parcel(s) straddle Wulfsohn Road on the west end near Midland Ave. The existing GMF is on the south side and Park and Ride (P&R) lot on the north side of Wulfsohn.



FIGURE 1 - STUDY AREA

The study intersections are as follows.

- Midland Ave. and Devereux Rd. (#3)
- Midland Ave. and West Wulfsohn Rd. (#4)
- Wulfsohn Rd. and RFTA GMF / P&R (#20)
- 8th and Colorado (#13)
- 9th and Colorado (#15)
- 9th and Grand (#16)

The study intersections are shown in Figure 2.







FIGURE 2 - STUDY INTERSECTIONS

## 1.1 Project Description

The RFTA GMF is located on the west end of Wulfsohn Road in Glenwood Springs, Colorado. The September 2023 TIS included phases 3/4/5/7 which were approved and constructed, but the land use had been revised and the constructed square footage of the operations center is provided below and revised in this analysis. The Phase 6A development of the site will also be included in this analysis. A summary of the development phases included in this study is outlined below, and overall site illustration is depicted in Figure 3.

- **Phase 3/4/5/7** - An increase from current operation to a 60-bus operation and a 9,647-sf new operations center as part of the previously approved and completed south side of Wulfsohn Road development.
- **Phase 6A** - Consists of the Transit Station (waiting and ticketing area) and an additional 22 Park and Ride spaces over the existing spaces provided.



FIGURE 3 - OVERALL SITE ILLUSTRATION

## 2.0 Methodology and Assumptions

This traffic impact study has been prepared in accordance with section 2.3(5) of the State Highway Access Code (SHAC) and the methodology and assumptions are provided in this section. The assumptions will provide a conservative analysis for the purposes of assessing operational and safety traffic impacts resulting from the proposed phased development.

This analysis uses HCM 6th Edition methodology and was performed using the Synchro 11 analysis package to estimate the capacity of the intersections. The MOE's that are compared for this study include LOS, delay and 95th percentile queue length. The MOE's will be reported for each analysis scenario to determine if the current intersections operate adequately. The 95<sup>th</sup> percentile queue length reported is based upon the average of ten 60-minute Simtraffic modeling runs.

**Previous Study Background** - SGM used the GMMTS for future Glenwood Meadows (GM) developed traffic (less RFTA Zone 5 traffic), distribution and assignment of future traffic, and growth factor beyond the GM developed traffic as presented in the GMMTS. The city has shared the GMMTS Synchro model to provide consistency with the previous modeling. Only the study intersection traffic volumes have been updated in the model. GM developed traffic volumes have been adjusted by subtracting the RFTA (Zone 5) volumes generated by the GMMTS. Updated RFTA Phase 3/4/5/7 and 6A buildout traffic volumes are generated in this study based on the development outlined in section 1.1 above.

**Baseline Traffic** - The City provided the 2023 GMMTS containing 2022 adjusted traffic volumes. New traffic counts performed by SGM on 4/25-26/2023 were completed for the following intersections:

- Midland and West Wulfsohn (7-9a; 4-6:30p)
- Wulfsohn and RFTA GMF / P&R (7-9a; 4-6:30p)
- 8th and Colorado (11a-1:30p; 4-6:30p)
- 9th and Colorado (11a-1:30p; 4-6:30p)
- 9th and Grand (11a-1:30p; 4-6:30p)

Baseline traffic counts were not adjusted using a seasonal factor based on CDOT count station on SH 82 in South Glenwood.

The GMMTS 2022 adjusted volumes, collected on a Thursday, were consistently greater than the Tuesday/Wednesday volumes collected by SGM. To normalize the 2023 SGM traffic volumes, a factor was established for each intersection to match the total intersection volume at each intersection counted by SGM as compared to the GMMTS 2022 adjusted volumes. The 2023 counted peak hour traffic volumes at the Wulfsohn / RFTA intersection were factored using the Midland / West Wulfsohn intersection.

### Analysis Years

Operational analysis of Baseline traffic (2025), 5-year Background and Developed traffic (2030), and 20-year Background and Developed traffic (2045) will be completed. The Background traffic scenarios include all area traffic *except for* the RFTA project generated traffic. The Developed traffic scenarios include the RFTA project generated traffic in addition to the Background traffic. The scenarios are summarized below.

- **Baseline Traffic (2025)** - The volumes for this scenario were calculated by applying an annual growth rate of 0.5% to the 2023 Baseline volumes outside the immediate

Glenwood Meadows travelshed - i.e. through traffic on Midland Ave, and downtown intersections.

- **Background Traffic (2030 and 2045)** - The volumes for these scenarios were calculated by applying the 0.5% annual growth rate to the volumes in the Baseline scenario, and then adding the Glenwood Meadows Developed Traffic (less RFTA traffic), as projected in the GMMTS
- **Total (2030 and 2045)** - RFTA Phase 3/4/5/7 and 6A buildout trip generation volumes were added to the 2030 and 2045 Background traffic scenarios above. Comparing the results of the Total traffic to the Background traffic will help to determine the extent of traffic impacts due to RFTA development.

The GMMTS provides a comprehensive overview of the entire Meadows area, and provides analysis for the 2022, 2030, and 2040 scenarios that include projected development and consideration of increased background traffic. The GMMTS assumes full buildout of Meadows in the 2030 scenario.

### Trip Generation Rates

The proposed trip generation for the development is described by phase and land use type below. Land use rates were developed from the ITE Trip Generation Manual, 11th Edition, unless noted otherwise.

- **Phase 3/4/5/7** - An increase from current operation to a 60-bus operation, which includes an increased bus schedule and associated staffing. Trip generation and volumes are based on the RFTA developed 60-bus program and are provided in Appendix F. 9,647 sf of new operations center use the General Office Building (Code 710) land use from ITE.
- **Phase 6A** - An increase of 22 Park and Ride spaces use Code 90.

TABLE 1 - TRIP GENERATION RATES

| Land Use                                  | Number of Units | ITE Code | Weekday Rate                                        | Design Hour Rates |             |            |         |             |            |
|-------------------------------------------|-----------------|----------|-----------------------------------------------------|-------------------|-------------|------------|---------|-------------|------------|
|                                           |                 |          |                                                     | AM Rate           | AM Entering | AM Exiting | PM Rate | PM Entering | PM Exiting |
| Ph3/4/5/7 - General Office Building (ksf) | 9,647           | 710      | 15.76                                               | 2.32              | 2.04        | 0.28       | 2.49    | 0.42        | 2.06       |
| Ph3/4/5/7 - 60 Bus expansion              |                 | *        | * based on RFTA 60-bus projections (by RFTA 6/2023) |                   |             |            |         |             |            |
| Ph6A - Park and Ride                      | 22              | 90       | 5.77                                                | 1.09              | 0.87        | 0.22       | 0.64    | 0.16        | 0.48       |

TABLE 2 - TRIP DISTRIBUTION

|                         | ITE Code | Basis of Rate                                       | Time Period Used Above    | Weekday Design Hour Distribution |        |       |        |
|-------------------------|----------|-----------------------------------------------------|---------------------------|----------------------------------|--------|-------|--------|
|                         |          |                                                     |                           | AM IN                            | AM OUT | PM IN | PM OUT |
| General Office Building | 710      | Fitted Curve                                        | Peak Hour adjacent Street | 88%                              | 12%    | 17%   | 83%    |
| 60 Bus expansion        | *        | * based on RFTA 60-bus projections (by RFTA 6/2023) |                           |                                  |        |       |        |
| Park and Ride           | 90       | Fitted Curve                                        | Peak Hour adjacent Street | 80%                              | 20%    | 25%   | 75%    |

### Design Hour Volume

The design hour volumes calculated in this study are based upon the peak hour of the adjacent street traffic for the proposed development land use types. The design hour volume used in this study is estimated to be the 30<sup>th</sup> highest hourly volume of the design year.

### Trip Reductions

Multi-modal trips could consist of walking, biking, car-pooling and transit options. The proximity of the RFTA GMF to the Park and Ride lot and as the hub of the Colorado River

and Roaring Fork valleys transit network makes the location convenient for all transportation modes.

Glenwood Springs is an area known for hiking and biking, along with that comes increased percentages of valley residents who use those modes of transportation for commuting and other trips that typically would have been taken with vehicles. The typical US average walking and biking distance for a commute or other trip is 0.25 miles and 3 miles, respectively. With more prevalent use of alternative transportation in the region, it would be reasonable to assume those distances are increased in the area. The Glenwood Meadows mixed use area is within walking and biking distance from the site.

Given the multi-modal opportunities, a 10% reduction in trips associated with future employees (Operations Center) is conservatively applied and summarized below.

- Phase 3/4/5/7 - 10% transit reduction applied to office
- Phase 6A - No transit reduction applied to the Park and Ride.

### Project Traffic Distribution

RFTA trip distribution is based on 2023 traffic distribution at project intersection for each leg with consideration given to GMMTS assumptions (90% oriented westerly / 10% oriented easterly). The Bus distribution is based on future RFTA programing.

## 2.1 Intersection Capacity Analysis

AM and PM level of service estimates were prepared in accordance with the Highway Capacity Manual 6<sup>th</sup> Edition (Transportation Research Board, 2016). For signalized intersections, the HCM measures level of service in terms of seconds of delay per vehicle. This is also a measure of driver discomfort, fuel consumption, and lost travel time. The table below relates the LOS to seconds of delay per vehicle at a signalized intersection.

**TABLE 3 - LEVEL OF SERVICE (LOS) CRITERIA SIGNALIZED INTERSECTIONS**

| Level of Service | Delay (seconds) |
|------------------|-----------------|
| A                | < 10.0          |
| B                | 10.1 to 20      |
| C                | 20.1 to 35      |
| D                | 35.1 to 55      |
| E                | 55.1 to 80      |
| F                | > 80.0          |

Source: *Highway Capacity Manual*, 2016

For unsignalized intersections, the Highway Capacity Manual defines level of service and delay in terms of seconds of stopped delay per vehicle, which is based on the number of acceptable gaps in the conflicting traffic stream. In general, the traffic movements analyzed are those controlled by stop signs or yield signs, and the left turn movements from the uncontrolled major street. The following table represents the level of service criteria for unsignalized intersections:

TABLE 4 - LEVEL OF SERVICE (LOS) CRITERIA UNSIGNALIZED INTERSECTIONS

| Level of Service | Delay (seconds) |
|------------------|-----------------|
| A                | < 10.0          |
| B                | 10.1 to 15      |
| C                | 15.1 to 25      |
| D                | 25.1 to 35      |
| E                | 35.1 to 50      |
| F                | > 50.0          |

Source: *Highway Capacity Manual*, 2016

The “overall” intersection level of service at a signalized or an unsignalized intersection corresponds with the average delay experienced on the minor street approaches and the uncontrolled major street movements. The unconflicted major street through movements are considered to have no delay. Because most of the intersection movements are major street movements with no delay, the overall intersection results in a LOS with less delay than the minor street approaches and conflicting major street movements (left turns) experience.

In general, CDOT and the City consider the overall intersection operation of LOS “D” or better acceptable during the peak hours. The goal is to also provide a similar LOS for each controlled intersection movement and/or approach.

This study will assess the operational measures of effectiveness (MOE’s) including Level of Service (LOS), Delay, and 95<sup>th</sup> percentile queue. The MOE analysis by movement provides an overview of all intersection approaches and conflicting movements and provides a more realistic picture of operations by controlled movement or approach as experienced and perceived by users. The MOE’s also provide a valuable reference point for comparison of LOS, Delay and Queue between scenarios.



### 3.0 Baseline Traffic Conditions (2025)

#### 3.1 Existing Roadways and Intersections

Roadway and intersection descriptions provided in the GMMTS are accurate at the time of this study and are provided in the Appendix. The GMMTS Synchro model is the basis for this study and serves to replicate the 2022 results from the GMMTS to provide a comparative baseline to understand potential impacts with the addition of the Background, RFTA, and GM traffic volumes.

#### 3.2 Baseline Intersection Capacity Analysis

Using the Baseline traffic volumes provided in Appendix A the capacity analysis was modeled in Synchro to estimate level of service and delay for each intersection.

Table 5 shows the overall results of the capacity analysis for the intersections in the study area. The study intersections operate at an acceptable overall LOS C or better under baseline conditions.

The MOE's, LOS, delay (seconds) and 95th percentile queue lengths (feet) by approach movement are also presented in Table 5 and provide a reference point of 2025 Baseline traffic conditions to understand the effect of growth unrelated to the proposed development provided in the 2030 Background traffic volumes. All but Grand Ave side street approach movements operate at an acceptable LOS D or better under baseline conditions. 9<sup>th</sup> Street approach movements operate at LOS E or worse during the PM peak hour.

Queuing is reported for each approach movement at the study intersections to provide another indication of intersection performance. A queue length of 20 ft represents a single vehicle. Highlighted queue lengths indicate that the queue length exceeds the link or storage bay distance and is depicted in the following MOE tables as shown below.

\*95th percentile queue exceeds link distance

\*95th percentile queue exceeds storage bay distance

\*\*Modeled link distance differs from actual link distance

The Baseline scenario shows results with 95<sup>th</sup> percentile queue lengths well below or near existing storage bay or link lengths, except for the NB Through movement, the EB, and the WB Left Turn movements at the 9<sup>th</sup> and Grand intersection during the PM design hour.

TABLE 5 - BASELINE - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2025 Baseline |               |     |       |                  |     |
|---------------------------------------|-------------------|----|-----------------------------------|---------------|---------------|-----|-------|------------------|-----|
|                                       |                   |    |                                   | Overall LOS   | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |     |
| #3 Midland Ave. and Devereux Rd.      | SEB L             | AM | 100                               | A             | 0.8           | A   | 8.2   | 42               |     |
|                                       |                   | PM |                                   | A             | 1.6           | B   | 10.5  | 45               |     |
|                                       | SWB L/R           | AM | 814**                             |               |               | C   | 20.2  | 57               |     |
|                                       |                   | PM |                                   |               |               | C   | 23.7  | 75               |     |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A             | 2.3           | A   | 7.5   | 5                |     |
|                                       |                   | PM |                                   | A             | 2.7           | A   | 7.3   | 3                |     |
|                                       | WB L              | AM | 1500**                            |               |               | A   | 8     | 13               |     |
|                                       |                   | PM |                                   |               |               | A   | 7.4   | 0                |     |
|                                       | NB R              | AM | 334**                             |               |               | A   | 9.2   | 59               |     |
|                                       |                   | PM |                                   |               |               | A   | 8.7   | 21               |     |
|                                       | NB T/L            | AM | 334**                             |               |               | B   | 10.6  | 30               |     |
|                                       |                   | PM |                                   |               |               | A   | 9.9   | 46               |     |
|                                       | SB                | AM | 254**                             |               |               | A   | 9.8   | 33               |     |
|                                       |                   | PM |                                   |               |               | A   | 9.2   | 44               |     |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | A             | 1.5           | A   | 8.2   | 30               | 6   |
|                                       |                   | PM |                                   | A             | 2.4           | A   | 9.8   | 14               | 8   |
|                                       | WB L              | AM | 95_1350                           |               |               | B   | 10.6  | 5                | 3   |
|                                       |                   | PM |                                   |               |               | A   | 8.5   | 15               | 15  |
|                                       | NB                | AM | 825                               |               |               | D   | 31.4  |                  | 73  |
|                                       |                   | PM |                                   |               |               | D   | 33.2  |                  | 70  |
|                                       | SB T/L            | AM | 327                               |               |               | D   | 28.8  |                  | 51  |
|                                       |                   | PM |                                   |               |               | C   | 21.8  |                  | 40  |
|                                       | SB R              | AM | 75                                |               |               | B   | 10.6  |                  | 25  |
|                                       |                   | PM |                                   |               |               | C   | 17    |                  | 51  |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | B             | 11.1          | B   | 10.3  |                  | 98  |
|                                       |                   | PM |                                   | B             | 10.1          | B   | 10.6  |                  | 185 |
|                                       | WB                | AM | 226                               |               |               | B   | 12.3  |                  | 138 |
|                                       |                   | PM |                                   |               |               | B   | 10.1  |                  | 93  |
|                                       | NB                | AM | 404                               |               |               | A   | 9.6   |                  | 58  |
|                                       |                   | PM |                                   |               |               | A   | 9.4   |                  | 78  |
|                                       | SB                | AM | 398                               |               |               | A   | 9.1   |                  | 52  |
|                                       |                   | PM |                                   |               |               | A   | 9.2   |                  | 65  |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A             | 8.9           | A   | 8.1   |                  | 58  |
|                                       |                   | PM |                                   | A             | 8             | A   | 7.8   |                  | 58  |
|                                       | WB                | AM | 211                               |               |               | A   | 8     |                  | 65  |
|                                       |                   | PM |                                   |               |               | A   | 7.7   |                  | 65  |
|                                       | NB                | AM | 418                               |               |               | A   | 7.9   |                  | 13  |
|                                       |                   | PM |                                   |               |               | A   | 7.5   |                  | 0   |
|                                       | SB                | AM | 404                               |               |               | A   | 9.6   |                  | 78  |
|                                       |                   | PM |                                   |               |               | A   | 8.4   |                  | 62  |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | A             | 10            | D   | 41.9  |                  | 66  |
|                                       |                   | PM |                                   | C             | 20.5          | E   | 76.2  |                  | 97  |
|                                       | EB T/R            | AM | 211                               |               |               | D   | 45.3  |                  | 81  |
|                                       |                   | PM |                                   |               |               | E   | 79.8  |                  | 135 |
|                                       | WB L              | AM | 75                                |               |               | D   | 43.5  |                  | 63  |
|                                       |                   | PM |                                   |               |               | E   | 71.9  |                  | 90  |
|                                       | WB T/R            | AM | 277                               |               |               | D   | 45.2  |                  | 65  |
|                                       |                   | PM |                                   |               |               | F   | 90.8  |                  | 192 |
|                                       | NB L              | AM | 150                               |               |               | A   | 7     |                  | 121 |
|                                       |                   | PM |                                   |               |               | A   | 7.4   |                  | 131 |
|                                       | NB TT/R           | AM | 433_433                           |               |               | B   | 11.8  | 296              | 250 |
|                                       |                   | PM |                                   |               |               | B   | 17    | 535              | 503 |
|                                       | SB L              | AM | 125                               |               |               | A   | 8.3   |                  | 50  |
|                                       |                   | PM |                                   |               |               | B   | 13.6  |                  | 69  |
|                                       | SB TT/R           | AM | 412_412                           |               |               | A   | 1.3   | 189              | 180 |
|                                       |                   | PM |                                   |               |               | B   | 10.7  | 245              | 236 |

1 – Delay expressed as average delay per vehicle in seconds/vehicle

## 4.0 Background Traffic (2030 and 2045)

The Baseline 2025 traffic volumes were used as a basis to develop the 5-year and 20-year Background (2030 and 2045) traffic volumes. The Midland Ave through movements and the intersections in the downtown area were adjusted using a 5-year growth factor of 1.025 and a 20-year growth factor of 1.105. No growth factor was applied to the project intersection on Wulfsohn Rd. The GMMTS assumed that the Glenwood Meadows development would be completed by 2030. Therefore, SGM includes the projected Glenwood Meadows traffic in these background scenarios.

### 4.1 Background Intersection Capacity Analysis

Using the 2030 and 2045 Background traffic volumes, the capacity analysis was modeled in Synchro to determine level of service and delay for each intersection. The 2030 and 2045 Background traffic volumes are provided in Appendix A.

#### 4.1.1 2030 Background Traffic

Table 6 shows the overall results of the capacity analysis for the study intersections. The study intersections operate at an overall LOS C or better, except for Midland Ave and Wulfsohn Rd, which degrades to LOS D and E in the AM and PM peak hours, respectively.

MOE analysis is also presented in Table 6 and provides an overview of intersection approach movements for 2030 Background traffic conditions for comparison to 2025 Baseline traffic conditions to understand the effect of background traffic volumes. Similar to the 2025 Baseline scenario, the Grand Ave side street approach movements operate at LOS E or worse during the PM peak hour. The NB Wulfsohn Rd approach to Midland also degrades to LOS E during the PM design hour due to the increased background Midland through traffic and the additional volume on Wulfsohn Rd from the Glenwood Meadows development.

Overall, the approach movement queue lengths increase slightly from Baseline to Background volumes. The most significant increase occurs at the Midland Ave and Wulfsohn Rd intersection, where the queue on the NB approach exceeds the length of the link to the Wulfsohn Rd and RFTA intersection, which results in a long queue on the WB approach to the study intersection. Additionally, the EB right movement at Midland Ave and Wulfsohn Rd exceeds the existing storage bay distance. The 9<sup>th</sup> Street approaches continue to have poor LOS and increased queuing.



TABLE 6 - 2030 BACKGROUND - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |         | Link/Storage Bay Distance (L_T_R) | 2025 Baseline |               |      |       |                  |     | 2030 Background |               |      |       |                  |     |      |    |
|---------------------------------------|-------------------|---------|-----------------------------------|---------------|---------------|------|-------|------------------|-----|-----------------|---------------|------|-------|------------------|-----|------|----|
|                                       |                   |         |                                   | Overall LOS   | Overall Delay | LOS  | Delay | 95th % Q (L_T_R) |     | Overall LOS     | Overall Delay | LOS  | Delay | 95th % Q (L_T_R) |     |      |    |
| #3 Midland Ave. and Devereux Rd.      | SEB L             | AM      | 100                               | A             | 0.8           | A    | 8.2   | 42               |     | A               | 0.8           | A    | 8.9   | 45               |     |      |    |
|                                       |                   | PM      |                                   | A             | 1.6           | B    | 10.5  | 45               |     | A               | 1.9           | B    | 11.7  | 49               |     |      |    |
|                                       | SWB L/R           | AM      | 814**                             |               |               | C    | 20.2  | 57               |     |                 |               | C    | 24.7  | 54               |     |      |    |
|                                       |                   | PM      |                                   |               |               | C    | 23.7  | 75               |     |                 |               | D    | 34.7  | 100              |     |      |    |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM      | 825                               | A             | 2.3           | A    | 7.5   | 5                |     | A               | 1.4           | A    | 7.9   | 8                |     |      |    |
|                                       |                   | PM      |                                   | A             | 2.7           | A    | 7.3   | 3                |     | A               | 1.6           | A    | 7.6   | 6                |     |      |    |
|                                       | WB L              | AM      | 1500**                            |               |               | A    | 8     | 13               |     |                 |               | A    | 8.2   | 1874             |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 7.4   | 0                |     |                 |               | A    | 7.5   | 965              |     |      |    |
|                                       | NB R              | AM      | 334**                             |               |               | A    | 9.2   | 59               |     |                 |               | A    | 9.6   | 82               |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 8.7   | 21               |     |                 |               | A    | 9     | 20               |     |      |    |
|                                       | NB T/L            | AM      | 334**                             |               |               | B    | 10.6  | 30               |     |                 |               | B    | 13.4  | 280              |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 9.9   | 46               |     |                 |               | B    | 11.6  | 165              |     |      |    |
|                                       | SB                | AM      | 254**                             |               |               | A    | 9.8   | 33               |     |                 |               | B    | 11.8  | 36               |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 9.2   | 44               |     |                 |               | B    | 10.4  | 50               |     |      |    |
|                                       |                   |         |                                   |               |               |      |       |                  |     |                 |               |      |       |                  |     |      |    |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM      | 95_776_25                         | A             | 1.5           | A    | 8.2   | 30               | 6   | 25              | D             | 34.6 | A     | 8.4              | 32  | 8    | 44 |
|                                       |                   | PM      |                                   | A             | 2.4           | A    | 9.8   | 14               | 8   | 27              | E             | 40.6 | B     | 10.5             | 45  | 1    | 42 |
|                                       | WB L              | AM      | 95_1350                           |               |               | B    | 10.6  | 5                | 3   |                 |               | B    | 11.1  | 13               | 2   |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 8.5   | 15               | 15  |                 |               | A    | 8.9   | 20               | 6   |      |    |
|                                       | NB                | AM      | 825                               |               |               | D    | 31.4  |                  | 73  |                 |               | F    | 283.1 |                  |     | 993  |    |
|                                       |                   | PM      |                                   |               |               | D    | 33.2  |                  | 70  |                 |               | F    | 366.8 |                  |     | 1055 |    |
|                                       | SB T/L            | AM      | 327                               |               |               | D    | 28.8  |                  | 51  |                 |               | E    | 36.1  |                  |     | 65   |    |
|                                       |                   | PM      |                                   |               |               | C    | 21.8  |                  | 40  |                 |               | D    | 32.2  |                  |     | 76   |    |
|                                       | SB R              | AM      | 75                                |               |               | B    | 10.6  |                  | 25  |                 |               | B    | 11    |                  |     | 35   |    |
|                                       |                   | PM      |                                   |               |               | C    | 17    |                  | 51  |                 |               | C    | 20.4  |                  |     | 73   |    |
|                                       |                   |         |                                   |               |               |      |       |                  |     |                 |               |      |       |                  |     |      |    |
| #13 8th St. and Colorado Ave.         | EB                | AM      | 218                               | B             | 11.1          | B    | 10.3  | 98               |     | C               | 16.3          | C    | 17.2  | 172              |     |      |    |
|                                       |                   | PM      |                                   | B             | 10.1          | B    | 10.6  | 185              |     | C               | 16.2          | C    | 16.5  | 169              |     |      |    |
|                                       | WB                | AM      | 226                               |               |               | B    | 12.3  | 138              |     |                 |               | C    | 17.3  | 179              |     |      |    |
|                                       |                   | PM      |                                   |               |               | B    | 10.1  | 93               |     |                 |               | C    | 17.5  | 169              |     |      |    |
|                                       | NB                | AM      | 404                               |               |               | A    | 9.6   | 58               |     |                 |               | B    | 10.7  | 56               |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 9.4   | 78               |     |                 |               | B    | 10.7  | 66               |     |      |    |
|                                       | SB                | AM      | 398                               |               |               | A    | 9.1   | 52               |     |                 |               | B    | 10.2  | 52               |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 9.2   | 65               |     |                 |               | B    | 10.5  | 61               |     |      |    |
|                                       |                   |         |                                   |               |               |      |       |                  |     |                 |               |      |       |                  |     |      |    |
| #15 9th St. and Colorado Ave.         | EB                | AM      | 501                               | A             | 8.9           | A    | 8.1   | 58               |     | A               | 9             | A    | 8.1   | 56               |     |      |    |
|                                       |                   | PM      |                                   | A             | 8             | A    | 7.8   | 58               |     | A               | 7.9           | A    | 7.8   | 51               |     |      |    |
|                                       | WB                | AM      | 211                               |               |               | A    | 8     | 65               |     |                 |               | A    | 8     | 69               |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 7.7   | 65               |     |                 |               | A    | 7.7   | 65               |     |      |    |
|                                       | NB                | AM      | 418                               |               |               | A    | 7.9   | 13               |     |                 |               | A    | 7.9   | 15               |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 7.5   | 0                |     |                 |               | A    | 7.5   | 0                |     |      |    |
|                                       | SB                | AM      | 404                               |               |               | A    | 9.6   | 78               |     |                 |               | A    | 9.7   | 78               |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 8.4   | 62               |     |                 |               | A    | 8.3   | 55               |     |      |    |
|                                       |                   |         |                                   |               |               |      |       |                  |     |                 |               |      |       |                  |     |      |    |
| #16 9th St. and Grand Ave.            | EB L              | AM      | 75                                | A             | 10            | D    | 41.9  | 66               |     | B               | 10            | D    | 41.9  | 64               |     |      |    |
|                                       |                   | PM      |                                   | C             | 20.5          | E    | 76.2  | 97               |     | C               | 21.3          | E    | 76.3  | 95               |     |      |    |
|                                       | EB T/R            | AM      | 211                               |               |               | D    | 45.3  | 81               |     |                 |               | D    | 45.3  | 83               |     |      |    |
|                                       |                   | PM      |                                   |               |               | E    | 79.8  | 135              |     |                 |               | E    | 79.8  | 128              |     |      |    |
|                                       | WB L              | AM      | 75                                |               |               | D    | 43.5  | 63               |     |                 |               | D    | 43.4  | 55               |     |      |    |
|                                       |                   | PM      |                                   |               |               | E    | 71.9  | 90               |     |                 |               | E    | 71.9  | 86               |     |      |    |
|                                       | WB T/R            | AM      | 277                               |               |               | D    | 45.2  | 65               |     |                 |               | D    | 45.2  | 60               |     |      |    |
|                                       |                   | PM      |                                   |               |               | F    | 90.8  | 192              |     |                 |               | F    | 91.3  | 181              |     |      |    |
|                                       | NB L              | AM      | 150                               |               |               | A    | 7     | 121              |     |                 |               | B    | 12.3  | 135              |     |      |    |
|                                       |                   | PM      |                                   |               |               | A    | 7.4   | 131              |     |                 |               | A    | 7.7   | 110              |     |      |    |
|                                       | NB TT/R           | AM      | 433_433                           |               |               | B    | 11.8  | 296              | 250 |                 |               | B    | 12.2  | 324              | 257 |      |    |
|                                       |                   | PM      |                                   |               |               | B    | 17    | 535              | 503 |                 |               | B    | 18.6  | 531              | 493 |      |    |
|                                       | SB L              | AM      | 125                               |               |               | A    | 8.3   | 50               |     |                 |               | A    | 8.6   | 47               |     |      |    |
|                                       |                   | PM      |                                   |               |               | B    | 13.6  | 69               |     |                 |               | B    | 15.6  | 76               |     |      |    |
| SB TT/R                               | AM                | 412_412 |                                   |               | A             | 1.3  | 189   | 180              |     |                 | A             | 1.6  | 205   | 202              |     |      |    |
|                                       | PM                |         |                                   |               | B             | 10.7 | 245   | 236              |     |                 | B             | 11.1 | 274   | 270              |     |      |    |

1 – Delay expressed as average delay per vehicle in seconds/vehicle

#### 4.1.2 2045 Background Traffic

Table 7 shows the overall results of the capacity analysis for the study intersections. Again, the study intersections operate at an overall LOS C or better, except for Midland Ave and Wulfsohn Rd, which degrades to LOS E and F in the AM and PM peak hours, respectively, but the overall LOS of this intersection remains the same compared to the 2030 scenario.

MOE analysis is also presented in Table 7 and provides an overview of intersection approach movements for 2045 Background traffic conditions for comparison to 2030 Background traffic conditions to understand the effect of background traffic growth. The Grand Ave side street approach movements degrade slightly compared to the 2030 scenario. The NB and SB delays on Wulfsohn Rd increase significantly compared to the 2030 scenario. The SWB approach to the Midland Ave and Devereux Rd intersection also degrades to LOS D and E in the AM and PM peak hours respectively.

Overall, the approach movement queue lengths remain do not change significantly compared to the 2030 Background traffic scenario.

TABLE 7 - 2045 BACKGROUND - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2030 Background |               |     |       |                  | 2045 Background |               |     |       |                  |
|---------------------------------------|-------------------|----|-----------------------------------|-----------------|---------------|-----|-------|------------------|-----------------|---------------|-----|-------|------------------|
|                                       |                   |    |                                   | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |
| #3 Midland Ave. and Devereux Rd.      | SEB L             | AM | 100                               | A               | 0.8           | A   | 8.9   | 45               | A               | 0.8           | A   | 9     | 46               |
|                                       |                   | PM |                                   | A               | 1.9           | B   | 11.7  | 49               | A               | 2.1           | B   | 12.4  | 51               |
|                                       | SWB L/R           | AM | 814**                             |                 |               | C   | 24.7  | 54               |                 |               | D   | 27.9  | 94               |
|                                       |                   | PM |                                   |                 |               | D   | 34.7  | 100              |                 |               | E   | 42.4  | 114              |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A               | 1.4           | A   | 7.9   | 8                | A               | 1.4           | A   | 7.9   | 8                |
|                                       |                   | PM |                                   | A               | 1.6           | A   | 7.6   | 6                | A               | 1.6           | A   | 7.6   | 8                |
|                                       | WB L              | AM | 1500**                            |                 |               | A   | 8.2   | 1874             |                 |               | A   | 8.2   | 2067             |
|                                       |                   | PM |                                   |                 |               | A   | 7.5   | 965              |                 |               | A   | 8.3   | 1526             |
|                                       | NB R              | AM | 334**                             |                 |               | A   | 9.6   | 82               |                 |               | A   | 9.6   | 134              |
|                                       |                   | PM |                                   |                 |               | A   | 9     | 20               |                 |               | A   | 9.8   | 50               |
|                                       | NB T/L            | AM | 334**                             |                 |               | B   | 13.4  | 280              |                 |               | B   | 13.4  | 218              |
|                                       |                   | PM |                                   |                 |               | B   | 11.6  | 165              |                 |               | B   | 12    | 227              |
|                                       | SB                | AM | 254**                             |                 |               | B   | 11.8  | 36               |                 |               | B   | 11.8  | 35               |
|                                       |                   | PM |                                   |                 |               | B   | 10.4  | 50               |                 |               | B   | 10.4  | 59               |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | D               | 34.6          | A   | 8.4   | 32               | E               | 41.3          | A   | 8.5   | 44               |
|                                       |                   | PM |                                   | E               | 40.6          | B   | 10.5  | 45               | F               | 61.9          | B   | 10.9  | 42               |
|                                       | WB L              | AM | 95_1350                           |                 |               | B   | 11.1  | 13               |                 |               | B   | 11.6  | 11               |
|                                       |                   | PM |                                   |                 |               | A   | 8.9   | 20               |                 |               | A   | 9     | 19               |
|                                       | NB                | AM | 825                               |                 |               | F   | 283.1 | 993              |                 |               | F   | 358.5 | 998              |
|                                       |                   | PM |                                   |                 |               | F   | 366.8 | 1055             |                 |               | F   | 592.8 | 1014             |
|                                       | SB T/L            | AM | 327                               |                 |               | E   | 36.1  | 65               |                 |               | E   | 40.7  | 69               |
|                                       |                   | PM |                                   |                 |               | D   | 32.2  | 76               |                 |               | E   | 49.6  | 164              |
|                                       | SB R              | AM | 75                                |                 |               | B   | 11    | 35               |                 |               | B   | 11.3  | 40               |
|                                       |                   | PM |                                   |                 |               | C   | 20.4  | 73               |                 |               | C   | 22.4  | 99               |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | C               | 16.3          | C   | 17.2  | 172              | C               | 18.7          | C   | 19.7  | 184              |
|                                       |                   | PM |                                   | C               | 16.2          | C   | 16.5  | 169              | C               | 18            | C   | 18.6  | 180              |
|                                       | WB                | AM | 226                               |                 |               | C   | 17.3  | 179              |                 |               | C   | 20.3  | 180              |
|                                       |                   | PM |                                   |                 |               | C   | 17.5  | 169              |                 |               | C   | 20    | 180              |
|                                       | NB                | AM | 404                               |                 |               | B   | 10.7  | 56               |                 |               | B   | 11.1  | 64               |
|                                       |                   | PM |                                   |                 |               | B   | 10.7  | 66               |                 |               | B   | 11.1  | 67               |
|                                       | SB                | AM | 398                               |                 |               | B   | 10.2  | 52               |                 |               | B   | 10.6  | 51               |
|                                       |                   | PM |                                   |                 |               | B   | 10.5  | 61               |                 |               | B   | 10.8  | 60               |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A               | 9             | A   | 8.1   | 56               | A               | 9.3           | A   | 8.3   | 58               |
|                                       |                   | PM |                                   | A               | 7.9           | A   | 7.8   | 51               | A               | 8             | A   | 7.9   | 65               |
|                                       | WB                | AM | 211                               |                 |               | A   | 8     | 69               |                 |               | A   | 8.2   | 70               |
|                                       |                   | PM |                                   |                 |               | A   | 7.7   | 65               |                 |               | A   | 7.8   | 67               |
|                                       | NB                | AM | 418                               |                 |               | A   | 7.9   | 15               |                 |               | A   | 8     | 21               |
|                                       |                   | PM |                                   |                 |               | A   | 7.5   | 0                |                 |               | A   | 7.6   | 0                |
|                                       | SB                | AM | 404                               |                 |               | A   | 9.7   | 78               |                 |               | B   | 10.1  | 86               |
|                                       |                   | PM |                                   |                 |               | A   | 8.3   | 55               |                 |               | A   | 8.4   | 60               |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | B               | 10            | D   | 41.9  | 64               | B               | 10.7          | D   | 41.7  | 83               |
|                                       |                   | PM |                                   | C               | 21.3          | E   | 76.3  | 95               | C               | 23.7          | E   | 76.3  | 95               |
|                                       | EB T/R            | AM | 211                               |                 |               | D   | 45.3  | 83               |                 |               | D   | 45.3  | 122              |
|                                       |                   | PM |                                   |                 |               | E   | 79.8  | 128              |                 |               | F   | 80.1  | 120              |
|                                       | WB L              | AM | 75                                |                 |               | D   | 43.4  | 55               |                 |               | D   | 43.3  | 73               |
|                                       |                   | PM |                                   |                 |               | E   | 71.9  | 86               |                 |               | E   | 71.6  | 96               |
|                                       | WB T/R            | AM | 277                               |                 |               | D   | 45.2  | 60               |                 |               | D   | 45.2  | 84               |
|                                       |                   | PM |                                   |                 |               | F   | 91.3  | 181              |                 |               | F   | 95.5  | 177              |
|                                       | NB L              | AM | 150                               |                 |               | B   | 12.3  | 135              |                 |               | A   | 7.3   | 131              |
|                                       |                   | PM |                                   |                 |               | A   | 7.7   | 110              |                 |               | A   | 8.2   | 115              |
|                                       | NB TT/R           | AM | 433_433                           |                 |               | B   | 12.2  | 324              |                 |               | B   | 13.4  | 329              |
|                                       |                   | PM |                                   |                 |               | B   | 18.6  | 531              |                 |               | C   | 21.8  | 552              |
|                                       | SB L              | AM | 125                               |                 |               | A   | 8.6   | 47               |                 |               | A   | 9.2   | 66               |
|                                       |                   | PM |                                   |                 |               | B   | 15.6  | 76               |                 |               | B   | 20    | 77               |
|                                       | SB TT/R           | AM | 412_412                           |                 |               | A   | 1.6   | 205              |                 |               | A   | 1.9   | 312              |
|                                       |                   | PM |                                   |                 |               | B   | 11.1  | 274              |                 |               | B   | 11.9  | 294              |

1 – Delay expressed as average delay per vehicle in seconds/vehicle

## 5.0 Total Traffic (2030 and 2045) - RFTA Phase 3/4/5/7 and Phase 6A

### 5.1 Project Intersection

The RFTA GMF, P&R, and the project intersection (#20) are shown in Figure 4 below.



FIGURE 4 - RFTA GMF / PARK AND RIDE INTERSECTION WITH WULFSOHN ROAD

### 5.2 Project Access Trip Generation and Assignment

Using the trip generation rate and distribution assumptions provided in 2.0 Methodology the resulting trip generation by land use for Phase 3/4/5/7 and Phase 6A is provided in Table 8. Table 8 also applies the 10% trip reduction factor and presents the reduced traffic volumes.

TABLE 8 - ACCESS DESIGN HOURLY VOLUME BY LAND USE

| Land Use                                   | Number of Units | Weekday Traffic | Weekday Design Hour Traffic |           |           |           |
|--------------------------------------------|-----------------|-----------------|-----------------------------|-----------|-----------|-----------|
|                                            |                 |                 | AM IN                       | AM OUT    | PM IN     | PM OUT    |
| Ph 3/4/5/7 - General Office Building (ksf) | 9.647           | 152             | 20                          | 3         | 4         | 20        |
| Ph 3/4/5/7 - 60 Bus expansion              |                 |                 | 3                           | 14        | 4         | 8         |
| Ph6A - Park and Ride                       | 22              | 127             | 19                          | 5         | 4         | 11        |
| <b>Total Traffic</b>                       |                 | <b>279</b>      | <b>42</b>                   | <b>22</b> | <b>12</b> | <b>39</b> |
| <b>Total DHV</b>                           |                 |                 | <b>64</b>                   |           | <b>51</b> |           |
| <i>Ph 3/4/5/7 10% Transit Reduction</i>    |                 | 137             | 18                          | 3         | 4         | 18        |
| <b>Total Traffic (reduced)</b>             |                 | <b>264</b>      | <b>40</b>                   | <b>22</b> | <b>12</b> | <b>37</b> |
| <b>Total DHV (reduced)</b>                 |                 |                 | <b>62</b>                   |           | <b>49</b> |           |

### 5.3 Intersection Capacity Analysis

The Total traffic volumes for 2030 and 2045 are shown in Appendix A. The scenarios were modeled in Synchro and the results are presented below.

#### 5.3.1 2030 Total Traffic

Table 9 shows the overall LOS results of the capacity analysis for the study intersections for the 2030 Total traffic scenario. The study intersections operate at an overall LOS C or better, except for the Midland Ave and Wulfsohn Rd which degrades to LOS E and LOS F in the AM and PM peak hours, respectively.

MOE analysis is also presented in Table 9 and provides an overview of intersection approach movements to understand the effect of 2030 Total traffic volumes compared to the 2030 Background traffic. All intersection approach movements operate at LOS C or better except for those highlighted in the table; further summary is provided below.

##### **Wulfsohn Rd. and RFTA / P&R (#20)**

The project intersection operates at overall LOS A and all approach movements operate at LOS C or better in both scenarios. Expected 95<sup>th</sup> percentile queue lengths are within existing storage lengths. However, the modeled lengths are affected by the large queue length at the Wulfsohn Rd. approach to the Midland Ave. intersection.

##### **Midland Ave. and Devereux Rd. (#3)**

The SWB approach degrades to LOS D (E) in the 2030 Total scenario due to a slight increase in delay at the LOS interval threshold. However, the overall LOS for the intersection remains acceptable, and there are no negative impacts from the increased 95<sup>th</sup> percentile queue lengths.

##### **Midland Ave. and Wulfsohn Rd. (#4)**

The NB approach operates at LOS F (F) in the 2030 Background scenario. The 2030 Total traffic does increase the delay for this movement. The 95<sup>th</sup> percentile queue analysis generally shows increases across all approaches, compared to the 2030 Background scenario. The addition of the RFTA Total traffic grows the SB Right Turn queue length to 37 (76) ft, which exceeds the storage length in the PM peak hour.

##### **8<sup>th</sup> St. and Colorado Ave. (#13)**

The delays at this intersection increase from 2030 Background to 2030 Total scenario, but the LOS remains the same for each movement. However, the 95<sup>th</sup> percentile queuing analysis shows that the queue lengths on the EB approach exceed the length of the link from the intersection to Grand Ave.

##### **9<sup>th</sup> St. and Grand Ave. (#16):**

In the 2030 Background scenario, the EB and WB approach movements operate at LOS E or worse during the PM peak. The addition of the 2030 Total traffic degrades the operation slightly, and causes the EB Thru/Right movement to degrade to LOS F. However, the increase in delays is small, and the intersection still maintains an acceptable overall LOS A (C). The 95<sup>th</sup> percentile queue analysis indicates that the NB Left Turn exceeds the existing storage lengths with the addition of the 2030 Total traffic over the 2030 Background scenario.

TABLE 9 - 2030 TOTAL - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2030 Background |               |     |       |                  | 2030 Total (6A) |               |     |       |                  |
|---------------------------------------|-------------------|----|-----------------------------------|-----------------|---------------|-----|-------|------------------|-----------------|---------------|-----|-------|------------------|
|                                       |                   |    |                                   | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |
| #3 Midland Ave. and Devereux Rd.      | SEB L             | AM | 100                               | A               | 0.8           | A   | 8.9   | 45               | A               | 0.8           | A   | 9     | 47               |
|                                       |                   | PM |                                   | A               | 1.9           | B   | 11.7  | 49               | A               | 1.9           | B   | 11.8  | 49               |
|                                       | SWB L/R           | AM | 814**                             |                 |               | C   | 24.7  | 54               |                 |               | D   | 25.3  | 70               |
|                                       |                   | PM |                                   |                 |               | D   | 34.7  | 100              |                 |               | E   | 35.9  | 88               |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A               | 1.4           | A   | 7.9   | 8                | A               | 2.1           | A   | 8     | 12               |
|                                       |                   | PM |                                   | A               | 1.6           | A   | 7.6   | 6                | A               | 2.6           | A   | 7.6   | 11               |
|                                       | WB L              | AM | 1500**                            |                 |               | A   | 8.2   | 1874             |                 |               | A   | 7.9   | 2025             |
|                                       |                   | PM |                                   |                 |               | A   | 7.5   | 965              |                 |               | A   | 8.3   | 1294             |
|                                       | NB R              | AM | 334**                             |                 |               | A   | 9.6   | 82               |                 |               | A   | 9.8   | 341              |
|                                       |                   | PM |                                   |                 |               | A   | 9     | 20               |                 |               | A   | 9.5   | 84               |
|                                       | NB T/L            | AM | 334**                             |                 |               | B   | 13.4  | 280              |                 |               | C   | 15.2  | 441              |
|                                       |                   | PM |                                   |                 |               | B   | 11.6  | 165              |                 |               | B   | 12.6  | 276              |
|                                       | SB                | AM | 254**                             |                 |               | B   | 11.8  | 36               |                 |               | B   | 12.4  | 71               |
|                                       |                   | PM |                                   |                 |               | B   | 10.4  | 50               |                 |               | B   | 10.9  | 114              |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | D               | 34.6          | A   | 8.4   | 32               | E               | 38.2          | A   | 8.4   | 34               |
|                                       |                   | PM |                                   | E               | 40.6          | B   | 10.5  | 45               | F               | 60.5          | B   | 10.5  | 42               |
|                                       | WB L              | AM | 95_1350                           |                 |               | B   | 11.1  | 13               |                 |               | B   | 12    | 24               |
|                                       |                   | PM |                                   |                 |               | A   | 8.9   | 20               |                 |               | A   | 9.1   | 20               |
|                                       | NB                | AM | 825                               |                 |               | F   | 283.1 | 993              |                 |               | F   | 292.9 | 903              |
|                                       |                   | PM |                                   |                 |               | F   | 366.8 | 1055             |                 |               | F   | 479.2 | 1044             |
|                                       | SB T/L            | AM | 327                               |                 |               | E   | 36.1  | 65               |                 |               | D   | 32.7  | 57               |
|                                       |                   | PM |                                   |                 |               | D   | 32.2  | 76               |                 |               | D   | 31.8  | 77               |
|                                       | SB R              | AM | 75                                |                 |               | B   | 11    | 35               |                 |               | B   | 11.1  | 37               |
|                                       |                   | PM |                                   |                 |               | C   | 20.4  | 73               |                 |               | C   | 20    | 76               |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | C               | 16.3          | C   | 17.2  | 172              | C               | 19.1          | C   | 20.6  | 241              |
|                                       |                   | PM |                                   | C               | 16.2          | C   | 16.5  | 169              | C               | 21.5          | C   | 23.3  | 221              |
|                                       | WB                | AM | 226                               |                 |               | C   | 17.3  | 179              |                 |               | C   | 20.3  | 174              |
|                                       |                   | PM |                                   |                 |               | C   | 17.5  | 169              |                 |               | C   | 23.3  | 164              |
|                                       | NB                | AM | 404                               |                 |               | B   | 10.7  | 56               |                 |               | B   | 11.3  | 70               |
|                                       |                   | PM |                                   |                 |               | B   | 10.7  | 66               |                 |               | B   | 12.1  | 90               |
|                                       | SB                | AM | 398                               |                 |               | B   | 10.2  | 52               |                 |               | B   | 10.5  | 60               |
|                                       |                   | PM |                                   |                 |               | B   | 10.5  | 61               |                 |               | B   | 11.2  | 61               |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A               | 9             | A   | 8.1   | 56               | A               | 9.3           | A   | 8.2   | 54               |
|                                       |                   | PM |                                   | A               | 7.9           | A   | 7.8   | 51               | A               | 8.2           | A   | 7.9   | 57               |
|                                       | WB                | AM | 211                               |                 |               | A   | 8     | 69               |                 |               | A   | 8.1   | 68               |
|                                       |                   | PM |                                   |                 |               | A   | 7.7   | 65               |                 |               | A   | 7.9   | 80               |
|                                       | NB                | AM | 418                               |                 |               | A   | 7.9   | 15               |                 |               | A   | 7.9   | 13               |
|                                       |                   | PM |                                   |                 |               | A   | 7.5   | 0                |                 |               | A   | 7.6   | 0                |
|                                       | SB                | AM | 404                               |                 |               | A   | 9.7   | 78               |                 |               | B   | 10.2  | 78               |
|                                       |                   | PM |                                   |                 |               | A   | 8.3   | 55               |                 |               | A   | 8.7   | 65               |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | B               | 10            | D   | 41.9  | 64               | A               | 9.8           | D   | 42.3  | 66               |
|                                       |                   | PM |                                   | C               | 21.3          | E   | 76.3  | 95               | C               | 22.1          | E   | 75.6  | 97               |
|                                       | EB T/R            | AM | 211                               |                 |               | D   | 45.3  | 83               |                 |               | D   | 45.3  | 88               |
|                                       |                   | PM |                                   |                 |               | E   | 79.8  | 128              |                 |               | F   | 80.4  | 138              |
|                                       | WB L              | AM | 75                                |                 |               | D   | 43.4  | 55               |                 |               | D   | 43.4  | 58               |
|                                       |                   | PM |                                   |                 |               | E   | 71.9  | 86               |                 |               | E   | 71.8  | 98               |
|                                       | WB T/R            | AM | 277                               |                 |               | D   | 45.2  | 60               |                 |               | D   | 45.2  | 60               |
|                                       |                   | PM |                                   |                 |               | F   | 91.3  | 181              |                 |               | F   | 91.9  | 191              |
|                                       | NB L              | AM | 150                               |                 |               | B   | 12.3  | 135              |                 |               | A   | 7     | 125              |
|                                       |                   | PM |                                   |                 |               | A   | 7.7   | 110              |                 |               | A   | 8.1   | 160              |
|                                       | NB TT/R           | AM | 433_433                           |                 |               | B   | 12.2  | 324              |                 |               | B   | 12.1  | 296              |
|                                       |                   | PM |                                   |                 |               | B   | 18.6  | 531              |                 |               | B   | 19.4  | 558              |
|                                       | SB L              | AM | 125                               |                 |               | A   | 8.6   | 47               |                 |               | A   | 8.4   | 58               |
|                                       |                   | PM |                                   |                 |               | B   | 15.6  | 76               |                 |               | B   | 16.5  | 80               |
|                                       | SB TT/R           | AM | 412_412                           |                 |               | A   | 1.6   | 205              |                 |               | A   | 1.6   | 235              |
|                                       |                   | PM |                                   |                 |               | B   | 11.1  | 274              |                 |               | B   | 11.6  | 265              |

1 – Delay expressed as average delay per vehicle in seconds/vehicle



### 5.3.2 2045 Total Traffic

Table 10 shows the overall LOS results of the capacity analysis for the study intersections for the 2045 Total traffic scenario. The study intersections operate at an overall LOS C or better (or LOS D or better in the downtown core), except for the Midland Ave and Wulfsohn Rd which operates at LOS E and LOS F in the AM and PM peak hours, respectively, but does not change compared to the 2045 Background scenario.

MOE analysis is also presented in Table 10 and provides an overview of intersection approach movements to understand the effect of 2045 Total traffic volumes compared to the 2045 Background traffic. All intersection approach movements operate at LOS C or better (or LOS D or better in the downtown core), except for those highlighted in the table; further summary is provided below.

#### **Wulfsohn Rd. and RFTA / P&R (#20)**

The project intersection operates at overall LOS A and all approach movements operate at LOS C or better in both scenarios. Expected 95<sup>th</sup> percentile queue lengths are within existing storage lengths. However, the modeled queue lengths are affected by the queuing on the NB approach to the Midland Ave and Wulfsohn Rd intersection.

#### **Midland Ave. and Devereux Rd. (#3)**

The SWB approach operates at LOS D (E) in the 2045 Background scenario. With the addition of the 2045 Total traffic, the delays increase slightly, but there are no changes to the LOS. The overall LOS of the intersection remains acceptable, and there are no negative impacts from the 95<sup>th</sup> percentile queue lengths.

#### **Midland Ave. and Wulfsohn Rd. (#4)**

The NB approach operates at LOS F (F) in the 2045 Background scenario. The 2045 Total traffic does increase the delay for this movement.

#### **8<sup>th</sup> St. and Colorado Ave. (#13)**

The EB and WB approaches degrade to LOS D in the PM peak hour. However, this LOS is deemed acceptable by CDOT and the City of Glenwood Springs for Grand Ave / SH 82 corridor. The 95<sup>th</sup> percentile queue analysis shows that the length of the queue on the EB approach exceeds the length of the link from the intersection to Grand Ave.

#### **9<sup>th</sup> St. and Grand Ave. (#16):**

In the 2045 Background scenario, the EB and WB approach movements operate at LOS E or worse during the PM peak. The addition of 2045 Total traffic degrades the operation slightly, but the increase in delays is small, and there is no change to the LOS for any movements. The intersection still maintains an acceptable overall LOS B (C). The 95<sup>th</sup> percentile queue analysis indicates that the WB and EB left turns exceed the existing storage lengths in both the 2045 Background and 2045 Total scenarios. The addition of the Total traffic causes the NB left turn queue to exceed the existing storage length to a minor extent in both AM and PM peak hours.

TABLE 10 - 2045 TOTAL - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2045 Background |               |     |       |                  | 2045 Total (6A) |               |     |       |                  |
|---------------------------------------|-------------------|----|-----------------------------------|-----------------|---------------|-----|-------|------------------|-----------------|---------------|-----|-------|------------------|
|                                       |                   |    |                                   | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |
| #3 Midland Ave. and Devereux Rd.      | SEB L             | AM | 100                               | A               | 0.8           | A   | 9     | 46               | A               | 0.8           | A   | 9.1   | 43               |
|                                       |                   | PM |                                   | A               | 2.1           | B   | 12.4  | 51               | A               | 2.1           | B   | 12.6  | 51               |
|                                       | SWB L/R           | AM | 814**                             |                 |               | D   | 27.9  | 94               |                 |               | D   | 28.6  | 79               |
|                                       |                   | PM |                                   |                 |               | E   | 42.4  | 114              |                 |               | E   | 45.6  | 118              |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A               | 1.4           | A   | 7.9   | 8                | A               | 2.1           | A   | 8     | 15               |
|                                       |                   | PM |                                   | A               | 1.6           | A   | 7.6   | 8                | A               | 2.6           | A   | 7.6   | 7                |
|                                       | WB L              | AM | 1500**                            |                 |               | A   | 8.2   | 2067             |                 |               | A   | 7.9   | 2053             |
|                                       |                   | PM |                                   |                 |               | A   | 8.3   | 1526             |                 |               | A   | 8.3   | 1564             |
|                                       | NB R              | AM | 334**                             |                 |               | A   | 9.6   | 134              |                 |               | A   | 9.8   | 233              |
|                                       |                   | PM |                                   |                 |               | A   | 9.8   | 50               |                 |               | A   | 9.5   | 191              |
|                                       | NB T/L            | AM | 334**                             |                 |               | B   | 13.4  | 218              |                 |               | C   | 15.2  | 409              |
|                                       |                   | PM |                                   |                 |               | B   | 12    | 227              |                 |               | B   | 12.6  | 353              |
|                                       | SB                | AM | 254**                             |                 |               | B   | 11.8  | 35               |                 |               | B   | 12.4  | 65               |
|                                       |                   | PM |                                   |                 |               | B   | 10.4  | 59               |                 |               | B   | 10.9  | 147              |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | E               | 41.3          | A   | 8.5   | 44               | E               | 45.6          | A   | 8.5   | 35               |
|                                       |                   | PM |                                   | F               | 61.9          | B   | 10.9  | 42               | F               | 74.5          | B   | 10.9  | 44               |
|                                       | WB L              | AM | 95_1350                           |                 |               | B   | 11.6  | 11               |                 |               | B   | 12.6  | 27               |
|                                       |                   | PM |                                   |                 |               | A   | 9     | 19               |                 |               | A   | 9.2   | 18               |
|                                       | NB                | AM | 825                               |                 |               | F   | 358.5 | 998              |                 |               | F   | 369.7 | 902              |
|                                       |                   | PM |                                   |                 |               | F   | 592.8 | 1014             |                 |               | F   | 622.7 | 983              |
|                                       | SB T/L            | AM | 327                               |                 |               | E   | 40.7  | 69               |                 |               | E   | 36.6  | 58               |
|                                       |                   | PM |                                   |                 |               | E   | 49.6  | 164              |                 |               | E   | 35.4  | 89               |
|                                       | SB R              | AM | 75                                |                 |               | B   | 11.3  | 40               |                 |               | B   | 11.3  | 36               |
|                                       |                   | PM |                                   |                 |               | C   | 22.4  | 99               |                 |               | C   | 22    | 80               |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | C               | 18.7          | C   | 19.7  | 184              | C               | 22.4          | C   | 24    | 229              |
|                                       |                   | PM |                                   | C               | 18            | C   | 18.6  | 180              | D               | 25.6          | D   | 28.3  | 240              |
|                                       | WB                | AM | 226                               |                 |               | C   | 20.3  | 180              |                 |               | C   | 24.5  | 183              |
|                                       |                   | PM |                                   |                 |               | C   | 20    | 180              |                 |               | D   | 28    | 174              |
|                                       | NB                | AM | 404                               |                 |               | B   | 11.1  | 64               |                 |               | B   | 11.7  | 70               |
|                                       |                   | PM |                                   |                 |               | B   | 11.1  | 67               |                 |               | B   | 12.6  | 93               |
|                                       | SB                | AM | 398                               |                 |               | B   | 10.6  | 51               |                 |               | B   | 10.9  | 67               |
|                                       |                   | PM |                                   |                 |               | B   | 10.8  | 60               |                 |               | B   | 11.7  | 78               |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A               | 9.3           | A   | 8.3   | 58               | A               | 9.6           | A   | 8.4   | 55               |
|                                       |                   | PM |                                   | A               | 8             | A   | 7.9   | 65               | A               | 8.3           | A   | 8     | 54               |
|                                       | WB                | AM | 211                               |                 |               | A   | 8.2   | 70               |                 |               | A   | 8.3   | 77               |
|                                       |                   | PM |                                   |                 |               | A   | 7.8   | 67               |                 |               | A   | 8     | 77               |
|                                       | NB                | AM | 418                               |                 |               | A   | 8     | 21               |                 |               | A   | 8     | 21               |
|                                       |                   | PM |                                   |                 |               | A   | 7.6   | 0                |                 |               | A   | 7.7   | 0                |
|                                       | SB                | AM | 404                               |                 |               | B   | 10.1  | 86               |                 |               | B   | 10.6  | 87               |
|                                       |                   | PM |                                   |                 |               | A   | 8.4   | 60               |                 |               | A   | 8.8   | 67               |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | B               | 10.7          | D   | 41.7  | 83               | B               | 11.1          | D   | 41.1  | 71               |
|                                       |                   | PM |                                   | C               | 23.7          | E   | 76.3  | 95               | C               | 24.1          | E   | 75.6  | 98               |
|                                       | EB T/R            | AM | 211                               |                 |               | D   | 45.3  | 122              |                 |               | D   | 45.4  | 109              |
|                                       |                   | PM |                                   |                 |               | F   | 80.1  | 120              |                 |               | F   | 80.7  | 143              |
|                                       | WB L              | AM | 75                                |                 |               | D   | 43.3  | 73               |                 |               | D   | 43.3  | 63               |
|                                       |                   | PM |                                   |                 |               | E   | 71.6  | 96               |                 |               | E   | 71.5  | 100              |
|                                       | WB T/R            | AM | 277                               |                 |               | D   | 45.2  | 84               |                 |               | D   | 45.2  | 64               |
|                                       |                   | PM |                                   |                 |               | F   | 95.5  | 177              |                 |               | F   | 96.5  | 217              |
|                                       | NB L              | AM | 150                               |                 |               | A   | 7.3   | 131              |                 |               | A   | 7.6   | 154              |
|                                       |                   | PM |                                   |                 |               | A   | 8.2   | 115              |                 |               | A   | 8.7   | 161              |
|                                       | NB TT/R           | AM | 433_433                           |                 |               | B   | 13.4  | 329              |                 |               | B   | 13.9  | 338              |
|                                       |                   | PM |                                   |                 |               | C   | 21.8  | 552              |                 |               | C   | 22.1  | 533              |
|                                       | SB L              | AM | 125                               |                 |               | A   | 9.2   | 66               |                 |               | A   | 9.5   | 67               |
|                                       |                   | PM |                                   |                 |               | B   | 20    | 77               |                 |               | C   | 20.2  | 69               |
|                                       | SB TT/R           | AM | 412_412                           |                 |               | A   | 1.9   | 312              |                 |               | A   | 2     | 275              |
|                                       |                   | PM |                                   |                 |               | B   | 11.9  | 294              |                 |               | B   | 12.3  | 280              |

1 – Delay expressed as average delay per vehicle in seconds/vehicle



## 5.4 Total Traffic Auxiliary Turn Lane Analysis

Auxiliary turn lane requirements for access to Colorado State Highways and many local roadways are determined using the State Highway Access Code (SHAC) and based on the projected DHVs, the speed limit and geometry of the highway adjacent to the access, and the classification of the highway. The City uses the SHAC as the standard for determining the need for auxiliary lanes.

### 5.4.1 Wulfsohn Rd. and RFTA GMF/Park and Ride (#20)

For design purposes, the speed limit of Wulfsohn Rd. adjacent to the project is 25 mph in both directions.

Based on the SHAC 3.12 for a Category NR-C - Non-Rural Arterial, auxiliary turn lanes shall be installed according to the criteria below:

- a. A left turn lane with taper and storage length is required for any access with a projected peak hour left ingress turning volume greater than 25 vph. No deceleration length is required.
  - o *WB left volume 21 vph (35 PCEs) - Lane warranted*
  - o *EB left volume 15 vph - Lane not warranted*
- b. A right turn deceleration lane and taper length is required for any access with a projected peak hour right ingress turning volume greater than 50 vph. No deceleration length is required.
  - o *WB right volume: 33 vph - Lane not warranted*
  - o *EB right volume: 14 vph - Lane not warranted*

TABLE 11 - RFTA GMF / WULFSOHN INTERSECTION AUXILIARY LANE REQUIREMENTS

| Auxiliary Lane<br>(12 ft width) | Existing Condition<br>Storage (taper) (ft) | Standard Code Design<br>Storage (taper) (ft) | DHV<br>(vph/PCE) | Posted<br>Speed<br>(mph) | Storage<br>required<br>(ft) | 95th % Q<br>(ft) |
|---------------------------------|--------------------------------------------|----------------------------------------------|------------------|--------------------------|-----------------------------|------------------|
| WB Left Turn                    | -                                          | 50 + (90)                                    | 21/35            | 25                       | 50                          | 1564*            |

\*The result of queuing effect of Wulfsohn intersection with Midland

### 5.4.2 Midland Ave. and Wulfsohn Rd. (#4)

For design purposes, the speed limit of Midland Ave. at the intersection with Wulfsohn Rd. is 25 mph in both directions.

Based on the SHAC for a Category NR-C - Non-Rural Arterial, auxiliary turn lanes shall be installed according to the criteria below:

- a. A left turn lane with taper and storage length is required for any access with a projected peak hour left ingress turning volume greater than 25 vph. No deceleration length is required.
  - o *WB left volume 7 vph (9 PCEs) - Lane not warranted*
  - o *EB left volume 40 vph - Lane warranted*
- b. A right turn deceleration lane and taper length is required for any access with a projected peak hour right ingress turning volume greater than 50 vph. No deceleration length is required.
  - o *WB right volume: 43 vph - Lane not warranted*
  - o *EB right volume: 173 vph - Lane warranted*

TABLE 12 - MIDLAND / WULFSOHN INTERSECTION AUXILIARY LANE REQUIREMENTS

| Auxiliary Lane<br>(12 ft width) | Existing Condition<br>Storage (taper) (ft) | Standard Code Design<br>Storage (taper) (ft) | DHV<br>(vph/PCE) | Posted<br>Speed<br>(mph) | Storage<br>required<br>(ft) | 95th % Q<br>(ft) |
|---------------------------------|--------------------------------------------|----------------------------------------------|------------------|--------------------------|-----------------------------|------------------|
| EB Left Turn                    | 95 + (70)                                  | 50 + (90)                                    | 40               | 25                       | 50                          | 35               |
| EB Right Turn                   | 25 + (75)                                  | 175 + (90)                                   | 173              | 25                       | <b>50</b>                   | 49               |
| WB Left Turn                    | 95 + (70)                                  | 50 + (90)                                    | 7/9              | 25                       | 50                          | 27               |

The existing EB Left Turn storage bay distance of 95 ft. is sufficient. The existing EB Right Turn storage bay has a length of 25 ft and requires at least an additional 25 ft. to hold the project 95<sup>th</sup> percentile queue.

The State Access Code gives the following design parameters for tapers:

- All redirect tapers within a 25-mph speed zone should have a taper rate of 15:1
- All lane tapers within a 25-mph speed zone should have a taper rate of 7.5:1.

### 5.5 Wulfsohn Rd. and RFTA GMF/Park and Ride - Access Assessment

The existing project intersection is a two-way stop-controlled intersection with Wulfsohn Road uncontrolled and stop signs on the north and south approaches. This access lies within a tangent section of Wulfsohn Road. Both the NB and SB approaches can provide adequate entering sight distance for a Multi-Unit Truck and Bus, with available sight distance of 425 ft based on the 25-mph posted speed. Consideration needs to be given to the street trees on the south side of Wulfsohn to maintain vision for NB traffic through the required sight triangle. The 85<sup>th</sup> percentile speed on west Wulfsohn as reported in the GMMTS is approximately 35 mph and would require an entering sight distance of 595 ft. The SB approach provides this additional sight distance. The NB approach can provide a maximum distance of 475 ft with attention to tree trimming within the sight triangle of the street trees on the south side of Wulfsohn Road, sight distance beyond that is limited by the horizontal and vertical roadway geometry. Photographs of the existing access conditions are provided below.



FIGURE 5 - RFTA GMF NB APPROACH AT WULFSOHN ROAD (W / E)



FIGURE 6 - RFTA P&R SB APPROACH AT WULFSOHN ROAD (E / W)

The buildout of the RFTA GMF will result in an increase in both vehicular and pedestrian volumes at the Wulfsohn Road project intersection. The CDOT Pedestrian Crossing Guidelines provide guidance for the installation of crosswalks and appropriate treatments based on location, volumes, and roadway type.

Based on the future vehicular traffic on Wulfsohn Road, up to 5000 ADT, and increased pedestrian volumes with the addition of the administration building and park and ride expansion, the installation of a pedestrian crosswalk is recommended. The painted crosswalk should be located on the west side of the Wulfsohn Road intersection as shown in Figure 7. The crosswalk should be installed with warning signage per the MUTCD consisting of a W11-2 pedestrian crossing sign with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a W11-2 advanced pedestrian warning sign. Guidelines and calculations are provided in the Appendix.

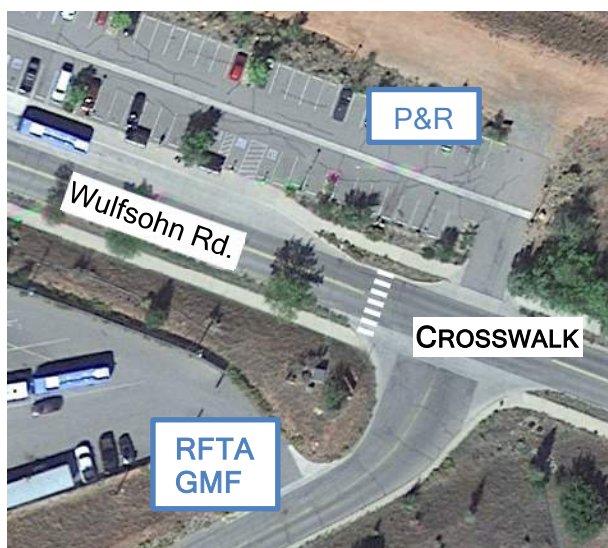


FIGURE 7 - RFTA P&R / GMF AT WULFSOHN ROAD - PEDESTRIAN CROSSING

## 5.6 State Highway Access Permit Evaluation

Based on the SHAC, an access permit is required when a change of greater than 20% occurs when accessing a state highway. Because there is not an existing permit for I-70 Exit #114, CDOT has directed to use the 2022 Existing Adjusted traffic volumes from the K-H

GMMTS as the permit threshold, those PCE volumes are calculated in Appendix F shown in Table 13. The table also presents the percentage of DHV added to the Exit #114 Interchange by the RFTA Total Traffic scenario, the RFTA total traffic falls below the 20% threshold that requires a CDOT Access Permit.

TABLE 13 - RFTA DHV AND 2022 I-70 DHV %

| RFTA                            | HOUR | DHV      | % 2025 DHV |
|---------------------------------|------|----------|------------|
| Total Traffic<br>(3/4/5/7 + 6A) | AM   | 102      | 7.5%       |
|                                 | PM   | 90       | 6.0%       |
|                                 |      |          |            |
|                                 |      | 2022 DHV |            |
|                                 |      | AM       | 1,359      |
|                                 |      | PM       | 1,493      |

## 5.7 Total Traffic - Summary of Conclusions

The analysis of the Background and Total traffic in 2030 and 2045 presented above results in the following conclusions.

- The degradation of LOS and Queuing at the Midland and Wulfsohn intersection is partially the result of the proposed RFTA traffic.
- Improvement of the Midland and Wulfsohn intersection is recommended considering the 2030 Background 2030 Total traffic at the NB approach will degrade to LOS E/F with excessive queue lengths.
- The RFTA traffic volumes warrant a WB left turn lane from Wulfsohn to the RFTA GMF access driveway.
- The development of the additional park and ride spaces should include a design for a two-lane SB approach to Wulfsohn Road to help alleviate potential SB queuing issues across the existing transit station and park and ride lot access aisle.
- At the NB approach to Wulfsohn, RFTA should work with the City to trim and/or remove trees to provide the maximum sight distance possible with existing geometric limitations (~475 ft).
- At the west side of the Wulfsohn Road project intersection, a painted crosswalk should be installed with warning signage per the MUTCD consisting of a W11-2 pedestrian crossing sign with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a W11-2 advanced pedestrian warning sign.
- The RFTA Total traffic does not trigger a CDOT Access Permit at Exit 114

## 6.0 Transportation Demand Management Strategies

Transportation demand management (TDM) is a set of strategies designed at maximizing traveler choices. *Managing demand is about providing travelers, regardless of whether they drive alone, with travel choices, such as work location, route, time of travel and mode. In the broadest sense, demand management is defined as providing travelers with effective choices to improve travel reliability.*<sup>1</sup>

RFTA is in the TDM business. The expansion of the GMF is a primary strategy to help provide future travelers more choices with expanded schedule, reduced travel times, and reliability. The approach to adding office space and additional park and ride spaces at this transit hub centered in the service valleys is an effective land-use strategy. The planned



development adjacent to several recent Meadows housing opportunities will serve to provide additional choices for live / work location for management, maintenance, and driver employees, while also serving to reduce vehicle miles traveled and trips. Both have benefits of reducing overall pollutants caused by vehicle emissions.

<sup>1</sup>FHWA, Mitigating Traffic Congestion-The Role of Demand-Side Strategies, prepared by ACT, Report No. FHWA-HOP-05-001, October 2004.

## 7.0 Conclusions and Proposed Mitigation Measures

### 7.1 Summary of Conclusions

- Overall, the Transit Center development project serves to reduce vehicle volumes by implementing a more robust transit system for the Colorado and Roaring Fork River valley corridors. Additional buses in the system and the park and ride spaces facilitate that primary goal.
- The Midland and Wulfsohn intersection will need improvement to accommodate the 2030 Background (inc. Glenwood Meadows) and 2030 Total (inc. RFTA) traffic volumes. In terms of percentages, the RFTA Phase 6A share of the volume at Midland and Wulfsohn intersection based on PCEs is as follows.
  - 2025 Baseline DHV - 1.68% AM / 1.05% PM
  - 2030 Background DHV - 1.37% AM / 0.83% PM
  - 2045 Background DHV - 1.30% AM / 0.79% PM
- The RFTA Total traffic does not trigger a CDOT Access Permit at Exit 114
- Except for the Midland and Wulfsohn and project access intersection, the remaining study intersections will operate not significantly worse than baseline condition or acceptably in their existing configurations considering the RFTA Total traffic.

### 7.2 Proposed Mitigation Measures

- Depending on the timing of potential Midland and Wulfsohn intersection improvements being implemented, consideration should be given to extending the existing EB right turn lane an additional 25 ft, for a total of 50 ft.
- The City has confirmed using an alternative and operational analysis that a two-lane roundabout is the preferred design alternative to improve the Midland Avenue and Wulfsohn Road intersection
- RFTA should provide for a WB left turn lane from Wulfsohn to the RFTA GMF access driveway.
- The RFTA development of the additional park and ride spaces should include design for a two-lane SB approach to Wulfsohn Road to help alleviate potential SB queuing issues across the transit station and park and ride lot access aisle.
- At the NB approach to Wulfsohn, RFTA should work with the City to trim and/or remove trees to provide the maximum sight distance possible with existing geometric limitations (~475 ft).
- At the west side of the Wulfsohn Road project intersection to facilitate pedestrian access to and from the park and ride, RFTA should install a painted crosswalk with warning signage per the MUTCD consisting of a W11-2 pedestrian crossing sign with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a W11-2 advanced pedestrian warning sign.
- The EB left, WB left, and NB left turn bay lengths are exceeded by 2030 Total traffic at the 9th/Grand intersection. The side street approach bays could be restriped to a

minimum of 160 ft length. The NB approach bay could be lengthened 10-20 ft by lowering the taper rate between the 10<sup>th</sup> Street SB left turn bay to the south.

- The EB and WB side street approaches of the intersection of 9th/Grand are shown to operate unacceptably during the PM design hour in the 2025 Baseline with background growth and development exacerbating the operations. There are similar LOS issues at the 8<sup>th</sup> Street intersection in the model and typical for most of the intersections in the SH 82 corridor from Glenwood Spring to Aspen. The City could work with CDOT to allow additional side street green time.

## Appendix A - TRAFFIC VOLUME FIGURES

Figure 5 – 2025 AM Baseline Volumes (E)

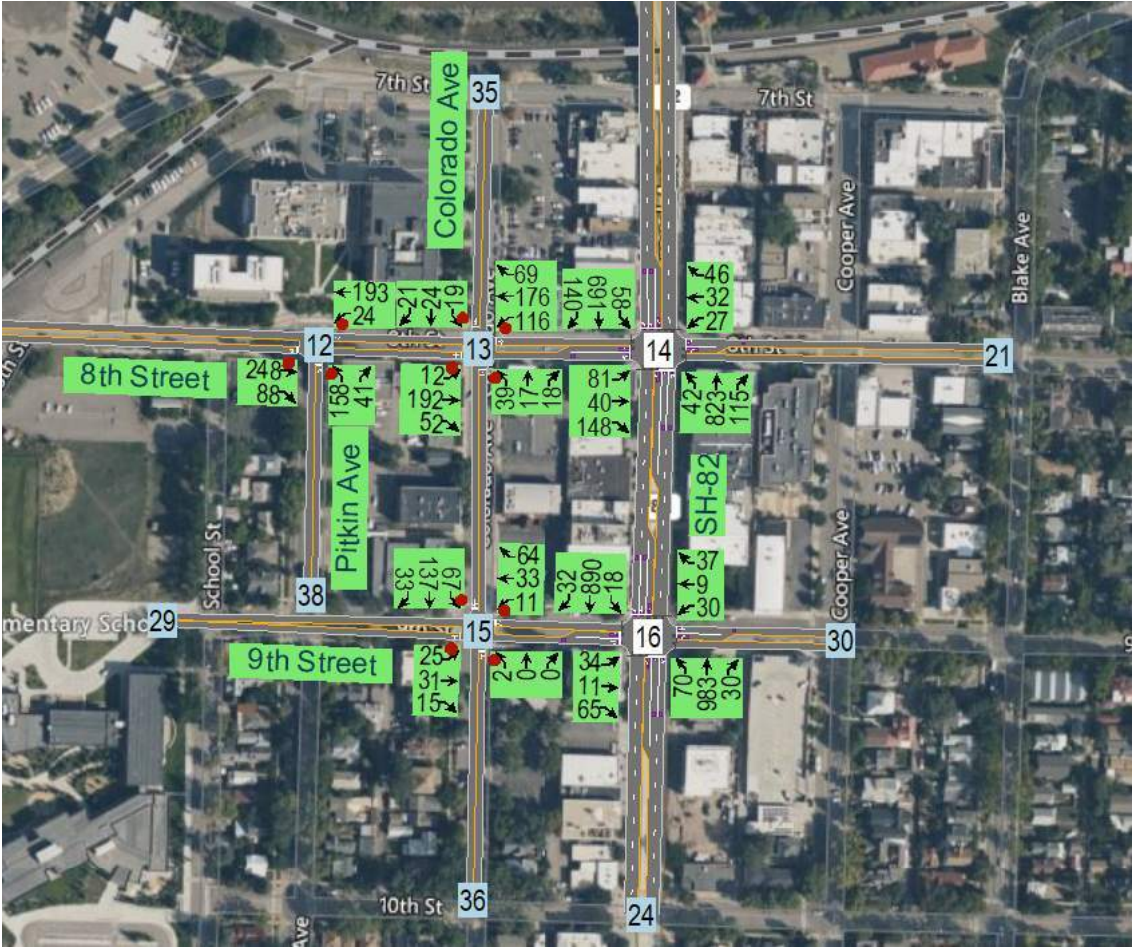




Figure 6 – 2025 AM Baseline Volumes (W)



Figure 7 – 2025 PM Baseline Volumes (E)

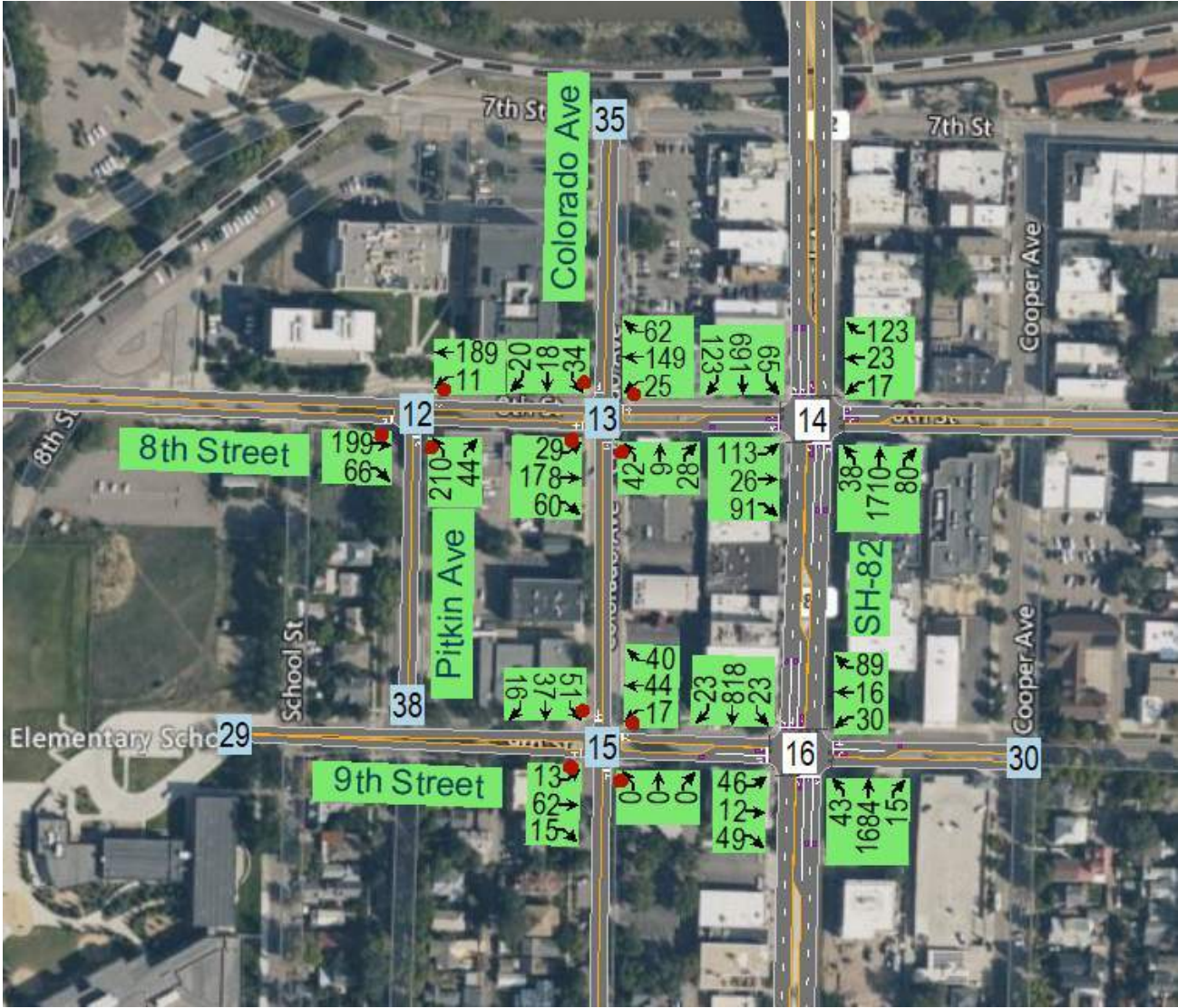




Figure 8 – 2025 PM Baseline Volumes (W)



### Figure 9 – 2030 AM Background Peak Volumes (E)

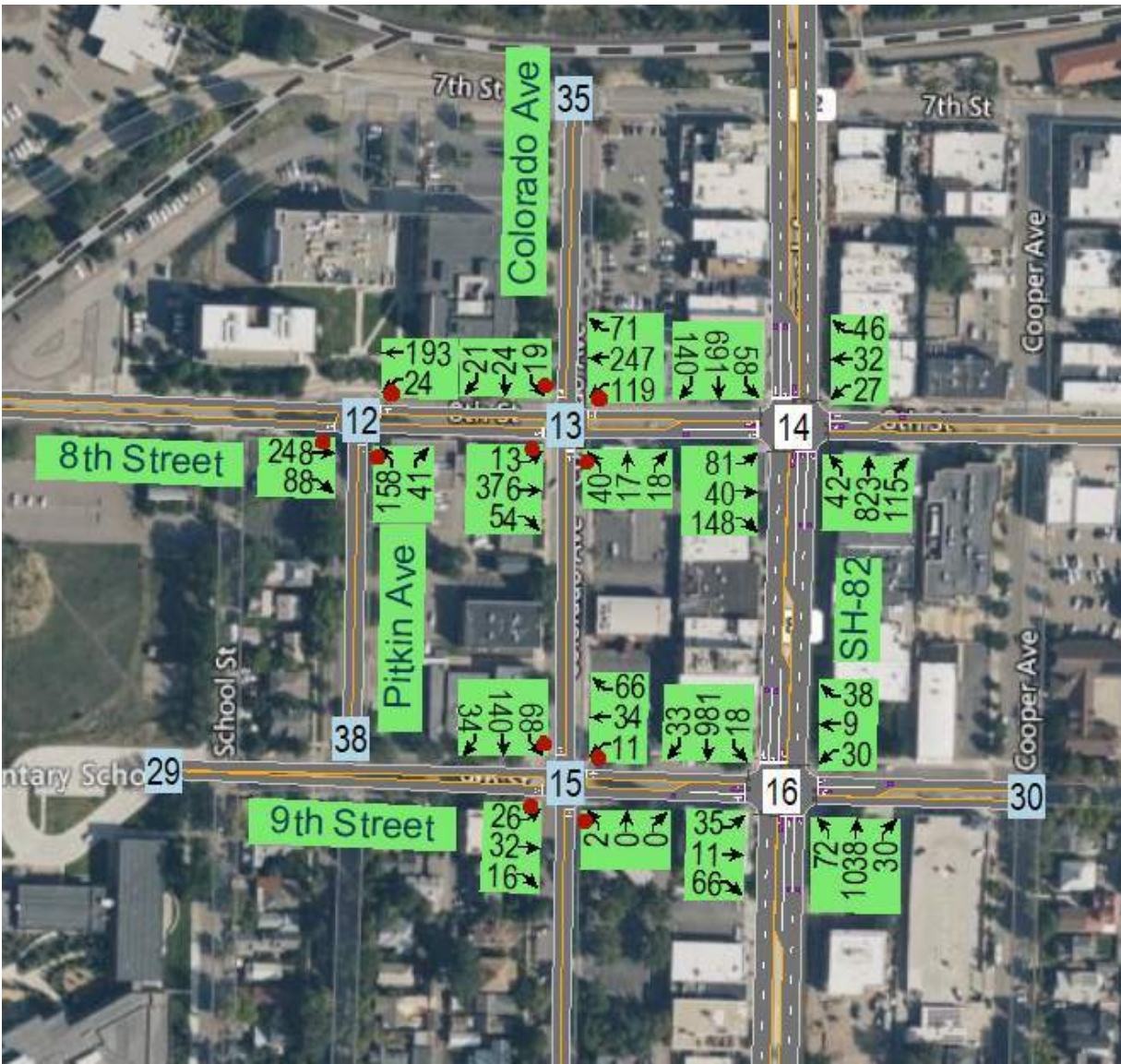




Figure 10 – 2030 AM Background Peak Volumes (W)



### Figure 11 – 2030 PM Background Peak Volumes (E)

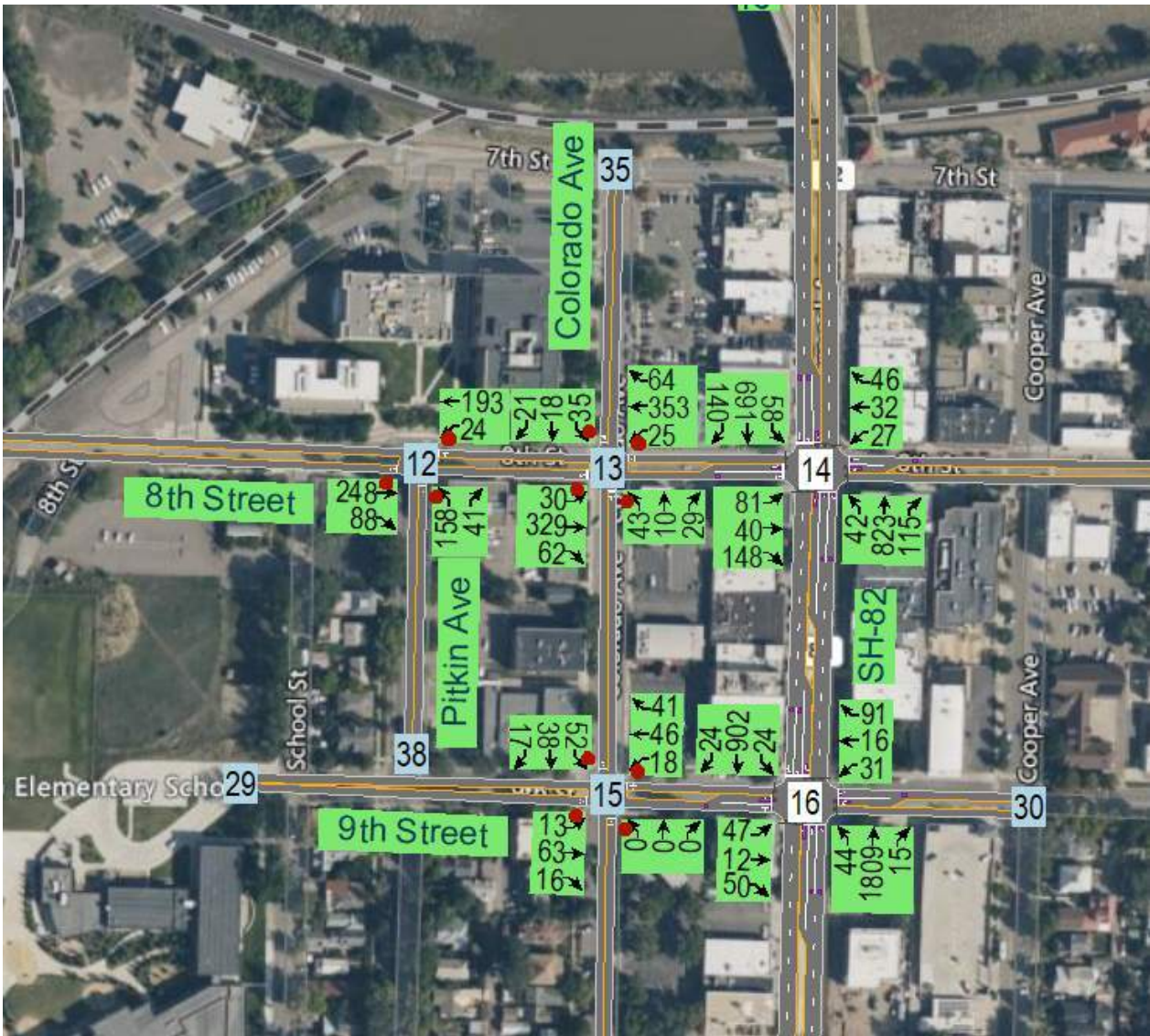




Figure 12 – 2030 PM Background Peak Volumes (W)

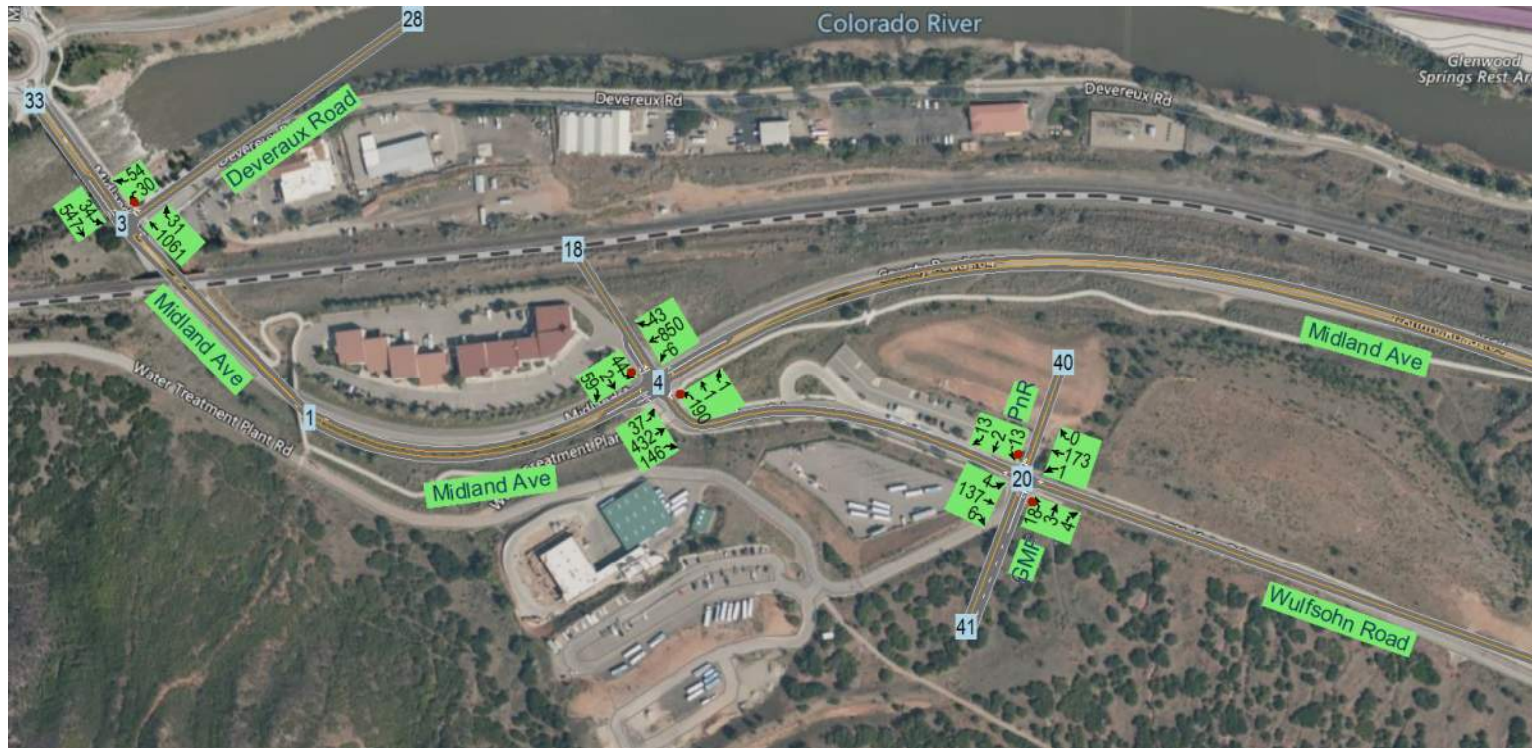
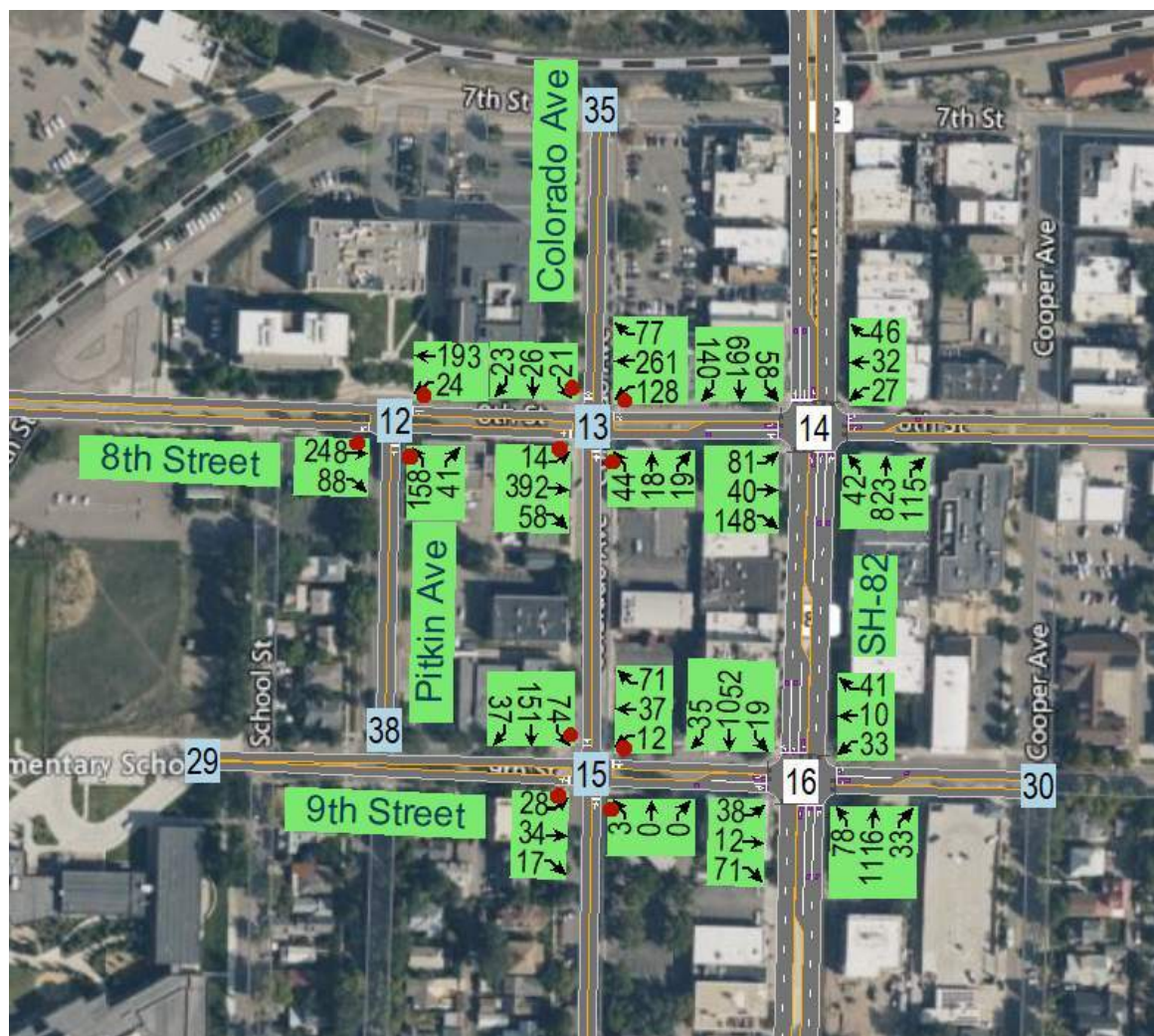


Figure 14 – 2045 AM Background Peak Volumes (E)





**Figure 15 – 2045 AM Background Peak Volumes (W)**



Figure 16 – 2045 PM Background Peak Volumes (E)

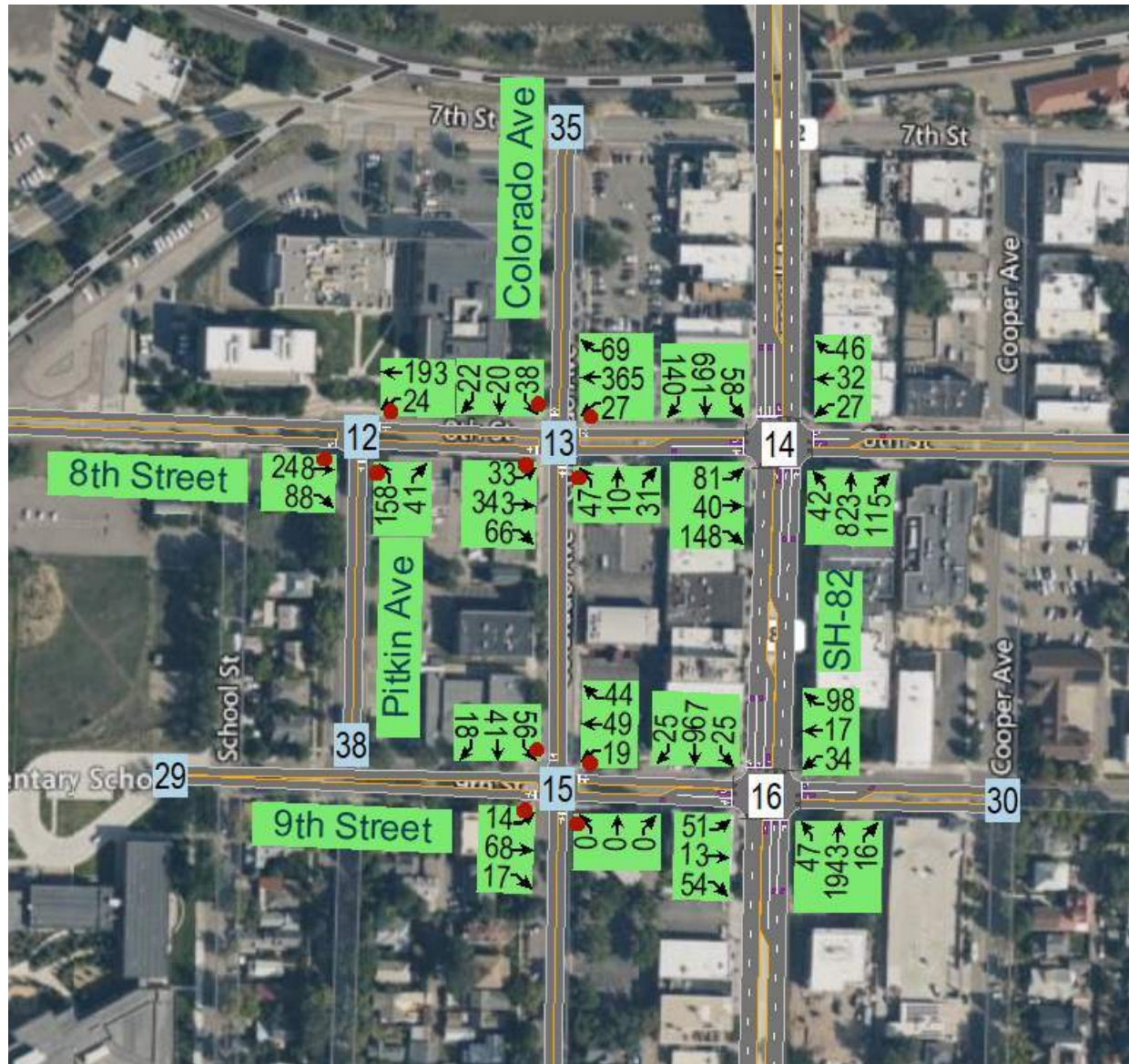




Figure 17 – 2045 PM Background Peak Volumes (W)



Figure 18 – 2030 AM Total Peak Volumes (E)

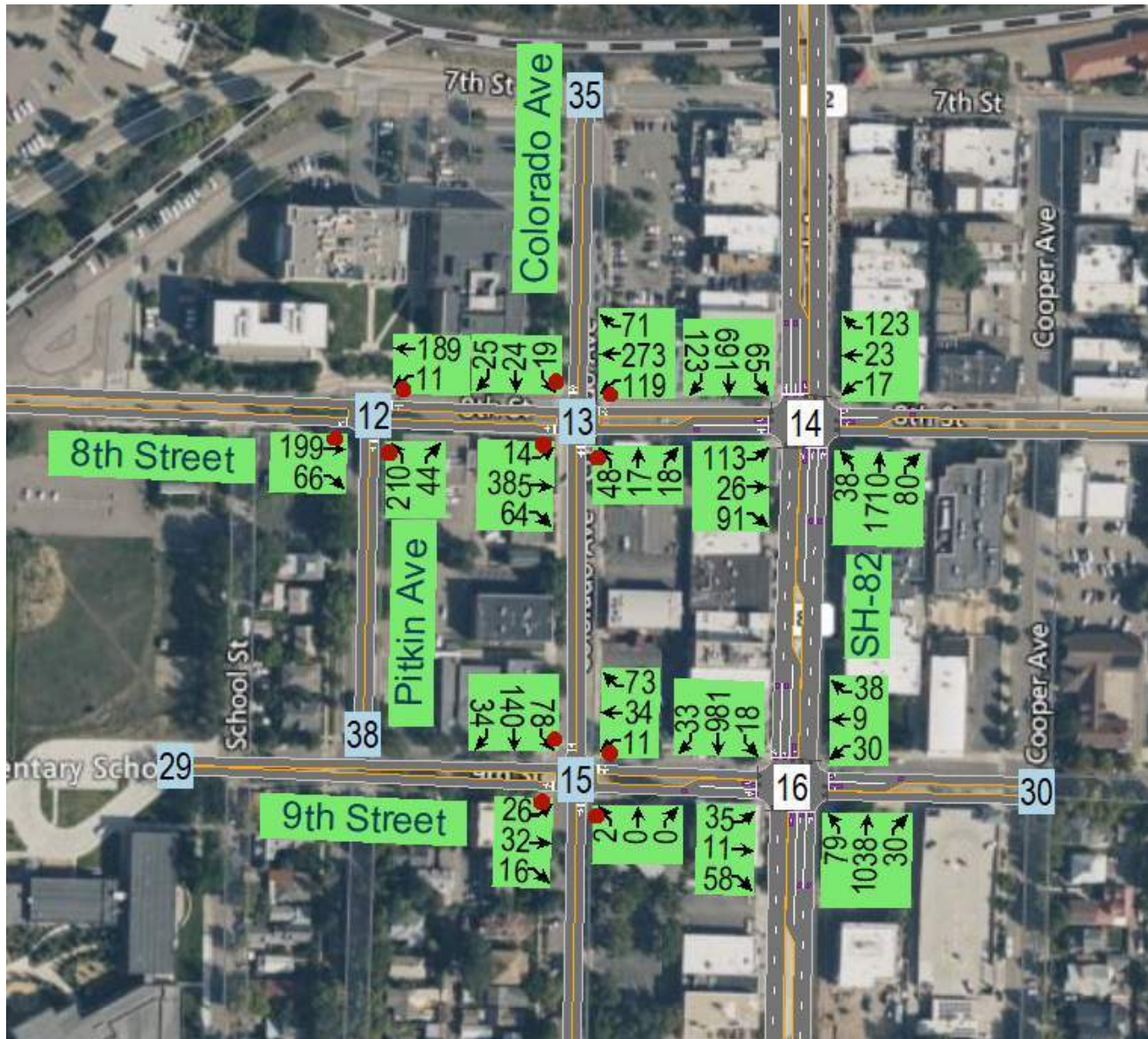




Figure 19 – 2030 AM Total Peak Volumes (W)



Figure 20 – 2030 PM Total Peak Volumes (E)

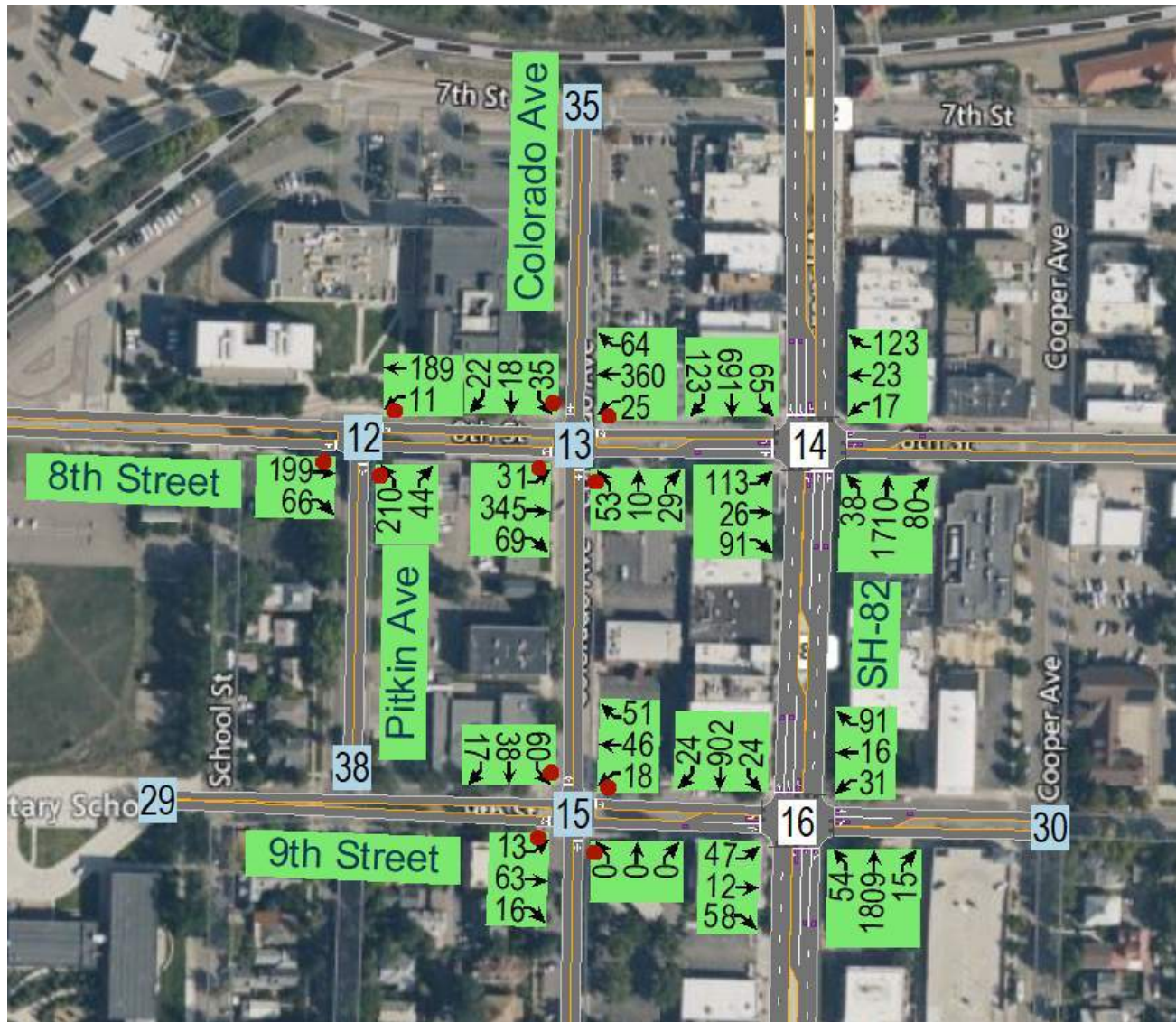




Figure 21 – 2030 PM Total Peak Volumes (W)



Figure 22 – 2045 AM Total Peak Volumes (E)

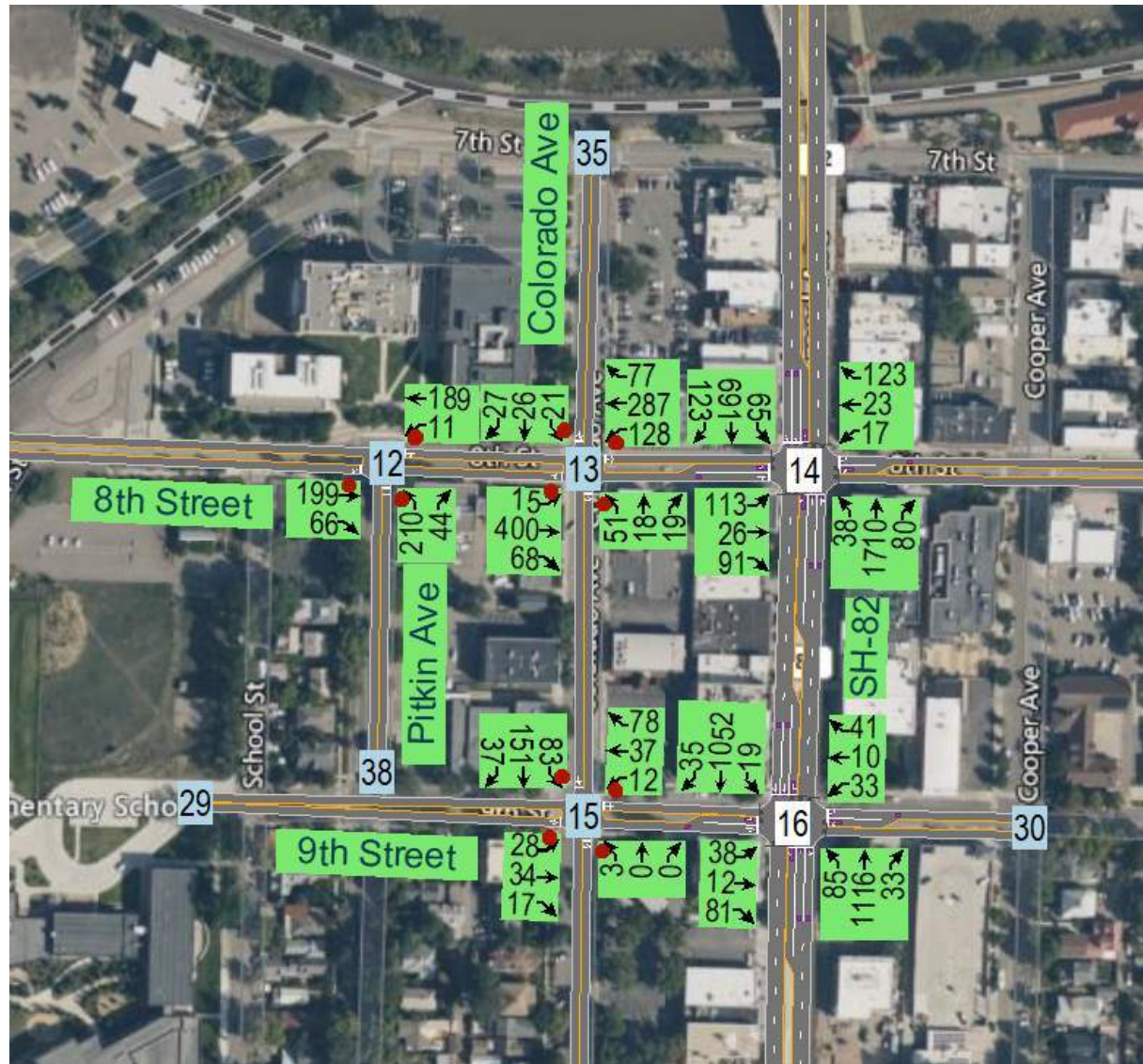




Figure 23 – 2045 AM Total Peak Volumes (W)



**Figure 24 – 2045 PM Total Peak Volumes (E)**

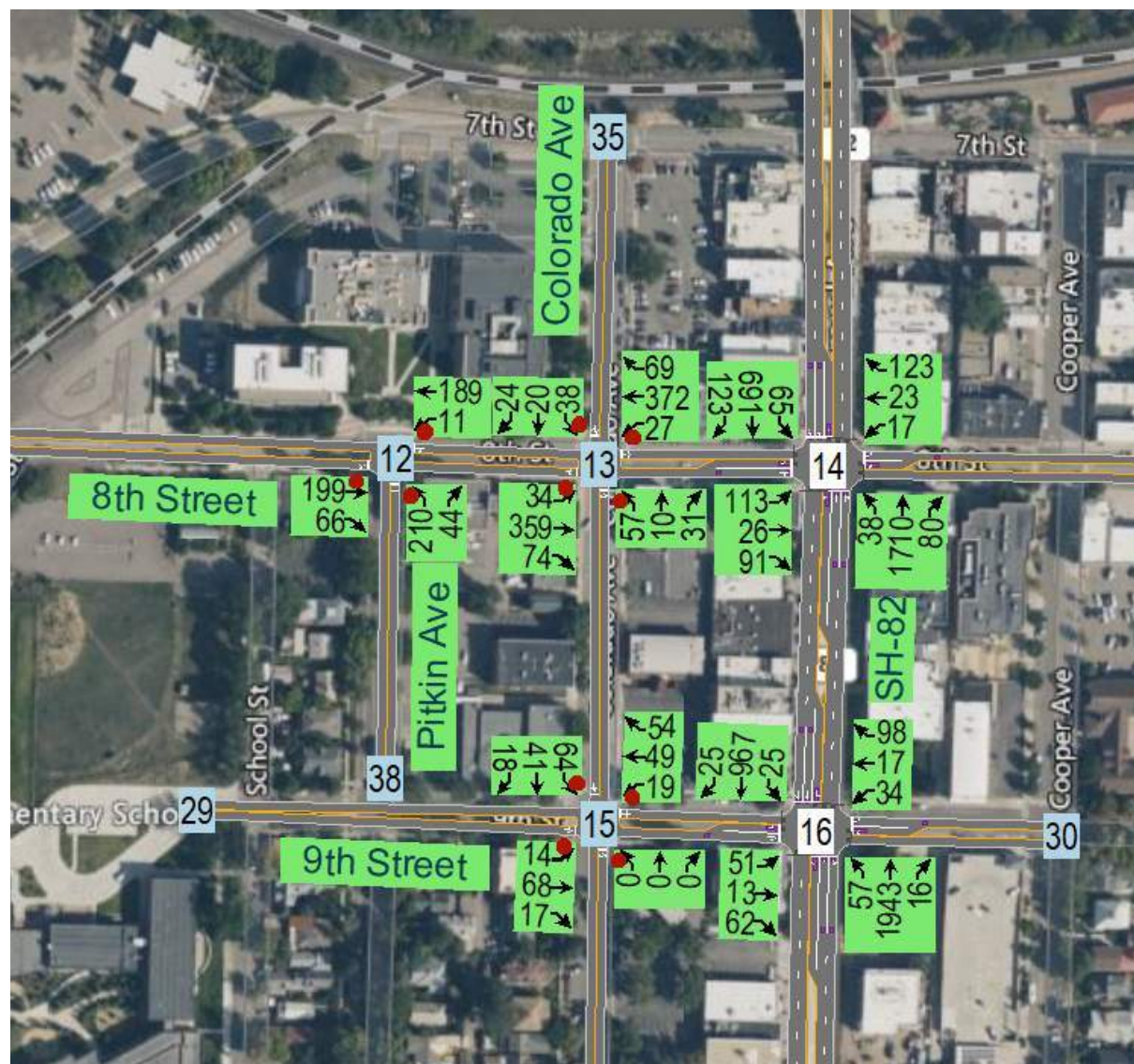




Figure 25 – 2045 PM Total Peak Volumes (W)



## Appendix B - METHODOLOGY / ASSUMPTIONS (CORRESPONDENCE WITH CoGS)



## SCOPING MEMO

**DATE:** December 17, 2024

**TO:** Eric Rolle, Shrewsberry  
Ben Ludlow, RFTA

**FROM:** Dan Cokley, PE, PTOE 

**RE:** RFTA GMF Traffic Study Update Scoping

---

This proposal includes the following scope that updates the RFTA GMF TIS dated 9/20/23 per the request of Ben Ludlow (study format), update submitted Land Use(s), and address City of Glenwood Springs questions dated 12/10/24 regarding the above referenced TIS.

SGM will provide (3) separate “analyses”, one for each phase described below.

- **Phase 6A** - An increase from current operation to a 60-bus option is outlined in the original study. Operations Center 9,647 sf. 110 space Park and Ride lot, an addition of 20 PnR spaces over existing.
- **Phase 6B** - Administrative offices, 30,790 sf.
- **Phase 8** - Bus maintenance and storage, 2752 sf. No additional trips.
- Employee Housing is deleted from the analysis

To provide the separate “analyses”, SGM would use the same format as the 2023 TIS (9/20/23) for Phase 6A. Phase 6A will include a 2030 (2027 rounding up) opening year analysis scenario, also performing a 2025 (current), and 2045 (20 yr) scenarios.

For Phase 6B, SGM would perform the same scenario analysis as an “amendment” to the 6A study, that would add the 6B Admin building land use traffic generation, but not replicate the 2025 analysis and other “existing condition and background” traffic discussion.

For Phase 8, we propose writing a letter identifying the use and noting the storage / warehouse does not generate additional traffic.

Respond to CoGS questions dated 12/10/24 within the updated traffic study. The planned response to comment # 2, will be as follows for submittal 1/3/2025.

*Provide analysis at intersections 1, 2, and 3 as a part of this analysis.*

- The original scoping with City Engineering did not include these intersections due to the insignificant changes in traffic volumes based upon percent traffic increase of ~5-6% at those intersections to cause an appreciable change in Level of Service or Delay. The percentages are provided in the updated study.

The allowance to address additional CoGS review comments includes this analysis if it is determined to be necessary following the re-submittal January 3<sup>rd</sup>.



## MEMORANDUM

**DATE:** *Revised February 20, 2023*

**TO:** Terri Partch, City Engineer, City of Glenwood Springs  
Jessica Bowser, Asst. City Engineer, City of Glenwood Springs

**FROM:** Dan Cokley, PE, PTOE

**RE:** RFTA GMF Level Three Traffic Analysis Methodology Proposal

---

A traffic impact study will be prepared using the guidelines of a Colorado Department of Transportation (CDOT) Level Three Traffic Impact Study (TIS) and will satisfy City of Glenwood Springs Engineering Standards Chapter 5.11 Traffic Impact Analysis Standards. The TIS will provide estimates for design hour traffic generation for the RFTA Glenwood Maintenance Facility (GMF) and adjacent Park and Ride lot proposed expansion which is planned to occur in several phases over several years.

This memo documents the methodology and assumptions that SGM intends to use for the RFTA GMF located on the west of Wulfsohn Road in Glenwood Springs, Colorado. The full development of the site and all phasing will be analyzed in this TIS. A summary (to be verified by RFTA prior to TIS) of the future development is provided below.

- Phase 3/4/5/7 - An increase from current operation to a 60-bus option is outlined in this study. 13,100sf of new operations center.
- Phase 6 - 14,400 sf Administration building.
- Phase 8 - 9,600sf Warehouse storage.
- Phase 9 - 74 employee housing units and additional 45-space Park and Ride expansion (total 130-space).

The goal of this memo is to gain the City's acceptance of the data intended for use in the analysis, assumptions proposed for the analysis (directional distribution, trip reduction factors, etc.) and to define the final scope and the overall approach to the TIS.

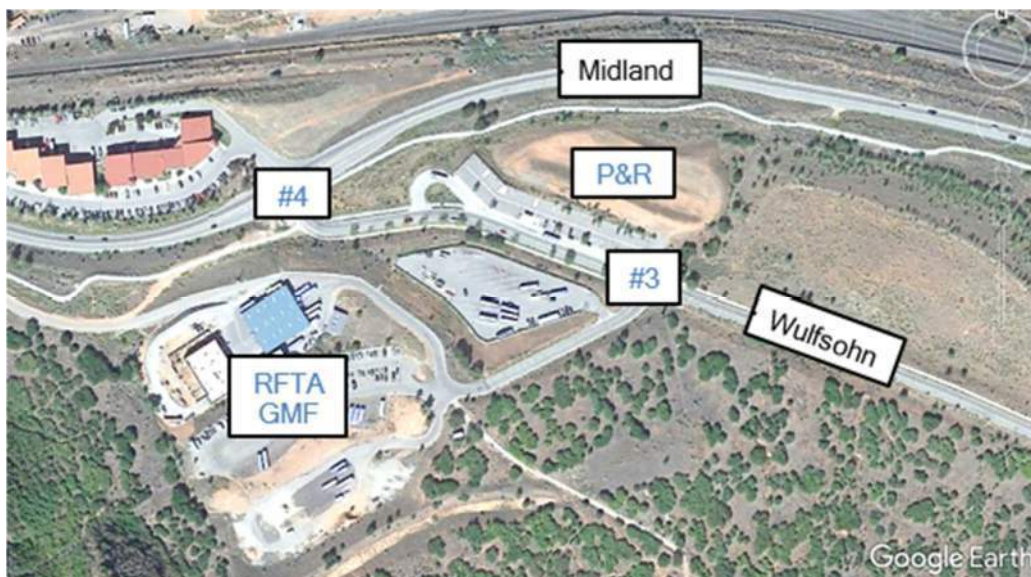


Figure 1 - RFTA GMF / Park and Ride Site Map



## ADD FIGURE 2 - Overall Site Plan (Ultimate Buildout)

Background - We intend to generally use the Glenwood Meadows Master Traffic Study by K-H (GMTS) for future development traffic, distribution and assignment of future traffic, and growth factor beyond the development traffic presented in the GMTS.

Baseline Traffic - *The City has had K-H update traffic counts which will be used for this study.*

*New traffic counts will be provided for the following intersections:*

4. Midland and West Wulfsohn
12. 8<sup>th</sup> and Colorado
13. RFTA access and Wulfsohn
14. 9<sup>th</sup> and Colorado
15. 9<sup>th</sup> and Grand

Baseline traffic counts will *NOT* be adjusted using a seasonal factor based on CDOT count station on SH 82 in South Glenwood.



**Figure 3 - RFTA GMF Scoping Map**

Analysis Years - Operational analysis of Baseline traffic (2023), 20-year background traffic (2043) and 20-year total traffic (2043) will be completed. Significant and impactful phasing may also warrant additional analysis prior to the 20-year timeframe.

Development and Growth - The TIS will input the future development considered in the GMTS for the Glenwood Meadows area, less RFTA (Zone 5) which will be developed in this TIS. This traffic will be distributed and assigned per the GMTS Figure 12. The TIS will use an annual growth rate





of 0.5% applied to volumes outside the immediate Glenwood Meadows travelshed (Intersections a. through e. above and through traffic on Midland Ave).

RFTA Land Use Rates - Trip generation rates from the ITE Trip Generation Manual, 11<sup>th</sup> Edition will be used

- Phase 3/4/5/7 - An increase from current operation to a 60-bus option, 13,100sf of new operations center (office). Use RFTA data for increased buses. General Office Building (Code 710).
- Phase 6 - 14,400 sf Administration building. Use General Office Building (Code 710)
- Phase 8 - 9,600sf Warehouse storage. No additional staffing, no additional trips.
- Phase 9 - 74 employee housing units and additional 45-space Park and Ride expansion (total 130-space). Use Park and Ride (Code 090) and Multi-Family Housing, Mid-rise (Code 221).

RFTA Traffic Distribution - The directional distribution for *RFTA staff and PnR* traffic will match existing travel patterns defined by counts at the RFTA accesses and Wulfsohn Road intersection and downstream intersection distributions. *Existing bus routes at time of GMTS / SGM counts vs future expansion of routes will be analyzed and implemented.*

Access Permits - Evaluation of the need for an Access Permit at Exit #114 and 9<sup>th</sup> / Grand by phase, using GMTS traffic counts.

Operational Analysis - Analysis of the will include intersections 4. - 13. outlined above. LOS, Delay, 95<sup>th</sup> Percentile Queue to be reported for each analysis scenario.

Auxiliary Lane Assessment - The need for auxiliary lanes at the project access intersection will be evaluated per the State Highway Access Code. Wulfsohn is assumed to be a Category NR-C (Non-Rural Arterial). The speed limit in the vicinity of the site is posted at 40 mph.

Multi-modal trip reduction - The location is adjacent to the existing Park and Ride. Given the multi-modal opportunities, a 10% reduction in trips associated with potential future employees (Operations and Administration buildings) and potential future residents (multi-Family housing) is conservatively applied and summarized below.

- Phase 3/4/5/7 - 10% transit reduction applied to office
- Phase 6 - 10% transit reduction applied to office
- Phase 8 - No additional trips.
- Phase 9 - 10% transit reduction applied to housing

*10% reduction will be applied a single time by land use.*

Transportation Demand Strategies - *Review opportunities for management staff, bus drivers, off peak hours.*

## Appendix C - SYNCHRO OUTPUT

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

| Intersection             |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 0.8                                                                               |                                                                                   |                                                                                   |          |                                                                                   |       |
| Movement                 | SEL                                                                               | SET                                                                               | NWT                                                                               | NWR      | SWL                                                                               | SWR   |
| Lane Configurations      |  |  |  |          |  |       |
| Traffic Vol, veh/h       | 59                                                                                | 1091                                                                              | 315                                                                               | 13       | 21                                                                                | 15    |
| Future Vol, veh/h        | 59                                                                                | 1091                                                                              | 315                                                                               | 13       | 21                                                                                | 15    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0        | 0                                                                                 | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free     | Stop                                                                              | Stop  |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None     | -                                                                                 | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -                                                                                 | -        | 0                                                                                 | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | 0                                                                                 | -        | 1                                                                                 | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | 0                                                                                 | -        | 0                                                                                 | -     |
| Peak Hour Factor         | 90                                                                                | 90                                                                                | 90                                                                                | 90       | 90                                                                                | 90    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2        | 2                                                                                 | 2     |
| Mvmt Flow                | 66                                                                                | 1212                                                                              | 350                                                                               | 14       | 23                                                                                | 17    |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Major/Minor              | Major1                                                                            | Major2                                                                            |                                                                                   | Minor2   |                                                                                   |       |
| Conflicting Flow All     | 364                                                                               | 0                                                                                 | -                                                                                 | 0        | 1701                                                                              | 357   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 357                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 1344                                                                              | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -                                                                                 | -        | 6.42                                                                              | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -                                                                                 | -        | 5.42                                                                              | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -                                                                                 | -        | 5.42                                                                              | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -                                                                                 | -        | 3.518                                                                             | 3.318 |
| Pot Cap-1 Maneuver       | 1195                                                                              | -                                                                                 | -                                                                                 | -        | 101                                                                               | 687   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 708                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 243                                                                               | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -                                                                                 | -        |                                                                                   |       |
| Mov Cap-1 Maneuver       | 1195                                                                              | -                                                                                 | -                                                                                 | -        | 95                                                                                | 687   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -                                                                                 | -        | 194                                                                               | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 669                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 243                                                                               | -     |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Approach                 | SE                                                                                | NW                                                                                |                                                                                   | SW       |                                                                                   |       |
| HCM Control Delay, s     | 0.4                                                                               | 0                                                                                 |                                                                                   | 20.2     |                                                                                   |       |
| HCM LOS                  | C                                                                                 |                                                                                   |                                                                                   |          |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Minor Lane/Major Mvmt    | NWT                                                                               | NWR                                                                               | SEL                                                                               | SETSWLn1 |                                                                                   |       |
| Capacity (veh/h)         | -                                                                                 | -                                                                                 | 1195                                                                              | -        | 277                                                                               |       |
| HCM Lane V/C Ratio       | -                                                                                 | -                                                                                 | 0.055                                                                             | -        | 0.144                                                                             |       |
| HCM Control Delay (s)    | -                                                                                 | -                                                                                 | 8.2                                                                               | -        | 20.2                                                                              |       |
| HCM Lane LOS             | -                                                                                 | -                                                                                 | A                                                                                 | -        | C                                                                                 |       |
| HCM 95th %tile Q(veh)    | -                                                                                 | -                                                                                 | 0.2                                                                               | -        | 0.5                                                                               |       |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 1.5                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 31                                                                                | 875                                                                               | 86                                                                                | 1                                                                                 | 351                                                                               | 19   | 42   | 0                                                                                 | 4    | 7    | 4                                                                                   | 6                                                                                   |
| Future Vol, veh/h        | 31                                                                                | 875                                                                               | 86                                                                                | 1                                                                                 | 351                                                                               | 19   | 42   | 0                                                                                 | 4    | 7    | 4                                                                                   | 6                                                                                   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                 | 0    | 0    | 0                                                                                   | 0                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88   | 88   | 88                                                                                | 88   | 88   | 88                                                                                  | 88                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 3                                                                                 | 4                                                                                 | 0                                                                                 | 2                                                                                 | 0    | 24   | 0                                                                                 | 0    | 60   | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 35                                                                                | 994                                                                               | 98                                                                                | 1                                                                                 | 399                                                                               | 22   | 48   | 0                                                                                 | 5    | 8    | 5                                                                                   | 7                                                                                   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |     | Minor2 |      |     |
|----------------------|--------|---|---|--------|---|---|--------|------|-----|--------|------|-----|
| Conflicting Flow All | 421    | 0 | 0 | 1092   | 0 | 0 | 1482   | 1487 | 994 | 1528   | 1574 | 410 |
| Stage 1              | -      | - | - | -      | - | - | 1064   | 1064 | -   | 412    | 412  | -   |
| Stage 2              | -      | - | - | -      | - | - | 418    | 423  | -   | 1116   | 1162 | -   |
| Critical Hdwy        | 4.1    | - | - | 4.1    | - | - | 7.34   | 6.5  | 6.2 | 7.7    | 6.5  | 6.2 |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.34   | 5.5  | -   | 6.7    | 5.5  | -   |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.34   | 5.5  | -   | 6.7    | 5.5  | -   |
| Follow-up Hdwy       | 2.2    | - | - | 2.2    | - | - | 3.716  | 4    | 3.3 | 4.04   | 4    | 3.3 |
| Pot Cap-1 Maneuver   | 1149   | - | - | 647    | - | - | 92     | 126  | 300 | 71     | 111  | 646 |
| Stage 1              | -      | - | - | -      | - | - | 245    | 302  | -   | 517    | 598  | -   |
| Stage 2              | -      | - | - | -      | - | - | 571    | 591  | -   | 196    | 272  | -   |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -    | -   | -      | -    | -   |
| Mov Cap-1 Maneuver   | 1149   | - | - | 647    | - | - | 87     | 122  | 300 | 68     | 107  | 646 |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 182    | 223  | -   | 147    | 206  | -   |
| Stage 1              | -      | - | - | -      | - | - | 238    | 293  | -   | 501    | 597  | -   |
| Stage 2              | -      | - | - | -      | - | - | 560    | 590  | -   | 187    | 264  | -   |

| Approach             | EB  | WB | NB   | SB   |
|----------------------|-----|----|------|------|
| HCM Control Delay, s | 0.3 | 0  | 31.4 | 22.4 |
| HCM LOS              |     |    | D    | C    |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 188   | 1149  | -   | -   | 647   | -   | -   | 164   | 646   |
| HCM Lane V/C Ratio    | 0.278 | 0.031 | -   | -   | 0.002 | -   | -   | 0.076 | 0.011 |
| HCM Control Delay (s) | 31.4  | 8.2   | -   | -   | 10.6  | -   | -   | 28.8  | 10.6  |
| HCM Lane LOS          | D     | A     | -   | -   | B     | -   | -   | D     | B     |
| HCM 95th %tile Q(veh) | 1.1   | 0.1   | -   | -   | 0     | -   | -   | 0.2   | 0     |

Intersection

Intersection Delay, s/veh 11.1

Intersection LOS B

| Movement            | EBL  | EBT                                                                               | EBR  | WBL  | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR  |
|---------------------|------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|
| Lane Configurations |      |  |      |      |  |      |      |  |      |      |  |      |
| Traffic Vol, veh/h  | 12   | 192                                                                               | 52   | 116  | 176                                                                               | 69   | 39   | 17                                                                                | 18   | 19   | 24                                                                                  | 21   |
| Future Vol, veh/h   | 12   | 192                                                                               | 52   | 116  | 176                                                                               | 69   | 39   | 17                                                                                | 18   | 19   | 24                                                                                  | 21   |
| Peak Hour Factor    | 0.92 | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                                | 0.92 |
| Heavy Vehicles, %   | 0    | 2                                                                                 | 12   | 2    | 4                                                                                 | 0    | 11   | 0                                                                                 | 0    | 0    | 0                                                                                   | 0    |
| Mvmt Flow           | 13   | 209                                                                               | 57   | 126  | 191                                                                               | 75   | 42   | 18                                                                                | 20   | 21   | 26                                                                                  | 23   |
| Number of Lanes     | 0    | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 0    | 1                                                                                   | 0    |

| Approach                   | EB   | WB   | NB  | SB  |
|----------------------------|------|------|-----|-----|
| Opposing Approach          | WB   | EB   | SB  | NB  |
| Opposing Lanes             | 1    | 1    | 1   | 1   |
| Conflicting Approach Left  | SB   | NB   | EB  | WB  |
| Conflicting Lanes Left     | 1    | 1    | 1   | 1   |
| Conflicting Approach Right | NB   | SB   | WB  | EB  |
| Conflicting Lanes Right    | 1    | 1    | 1   | 1   |
| HCM Control Delay          | 10.3 | 12.3 | 9.6 | 9.1 |
| HCM LOS                    | B    | B    | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 53%   | 5%    | 32%   | 30%   |
| Vol Thru, %            | 23%   | 75%   | 49%   | 38%   |
| Vol Right, %           | 24%   | 20%   | 19%   | 33%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 74    | 256   | 361   | 64    |
| LT Vol                 | 39    | 12    | 116   | 19    |
| Through Vol            | 17    | 192   | 176   | 24    |
| RT Vol                 | 18    | 52    | 69    | 21    |
| Lane Flow Rate         | 80    | 278   | 392   | 70    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.126 | 0.359 | 0.502 | 0.104 |
| Departure Headway (Hd) | 5.658 | 4.641 | 4.609 | 5.398 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 627   | 771   | 777   | 656   |
| Service Time           | 3.756 | 2.703 | 2.665 | 3.497 |
| HCM Lane V/C Ratio     | 0.128 | 0.361 | 0.505 | 0.107 |
| HCM Control Delay      | 9.6   | 10.3  | 12.3  | 9.1   |
| HCM Lane LOS           | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.4   | 1.6   | 2.9   | 0.3   |

Intersection

Intersection Delay, s/veh 8.9

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 25   | 31   | 15   | 11   | 33   | 64   | 2    | 0    | 0    | 67   | 137  | 33   |
| Future Vol, veh/h   | 25   | 31   | 15   | 11   | 33   | 64   | 2    | 0    | 0    | 67   | 137  | 33   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 0    | 12   | 0    | 0    | 4    | 11   | 0    | 0    | 0    | 11   | 1    | 4    |
| Mvmt Flow           | 27   | 33   | 16   | 12   | 35   | 69   | 2    | 0    | 0    | 72   | 147  | 35   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB | NB  | SB  |
|----------------------------|-----|----|-----|-----|
| Opposing Approach          | WB  | EB | SB  | NB  |
| Opposing Lanes             | 1   | 1  | 1   | 1   |
| Conflicting Approach Left  | SB  | NB | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1  | 1   | 1   |
| Conflicting Approach Right | NB  | SB | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1  | 1   | 1   |
| HCM Control Delay          | 8.1 | 8  | 7.9 | 9.6 |
| HCM LOS                    | A   | A  | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 10%   | 28%   |
| Vol Thru, %            | 0%    | 44%   | 31%   | 58%   |
| Vol Right, %           | 0%    | 21%   | 59%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 2     | 71    | 108   | 237   |
| LT Vol                 | 2     | 25    | 11    | 67    |
| Through Vol            | 0     | 31    | 33    | 137   |
| RT Vol                 | 0     | 15    | 64    | 33    |
| Lane Flow Rate         | 2     | 76    | 116   | 255   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.003 | 0.097 | 0.138 | 0.318 |
| Departure Headway (Hd) | 4.825 | 4.585 | 4.268 | 4.494 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 742   | 783   | 842   | 800   |
| Service Time           | 2.854 | 2.606 | 2.286 | 2.515 |
| HCM Lane V/C Ratio     | 0.003 | 0.097 | 0.138 | 0.319 |
| HCM Control Delay      | 7.9   | 8.1   | 8     | 9.6   |
| HCM Lane LOS           | A     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.3   | 0.5   | 1.4   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                       | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations            |  |  |      |  |  |      |  |  |      |  |  |      |
| Traffic Volume (veh/h)         | 34                                                                                | 11                                                                                | 65   | 30                                                                                | 9                                                                                 | 37   | 70                                                                                | 983                                                                               | 30   | 18                                                                                  | 890                                                                                 | 32   |
| Future Volume (veh/h)          | 34                                                                                | 11                                                                                | 65   | 30                                                                                | 9                                                                                 | 37   | 70                                                                                | 983                                                                               | 30   | 18                                                                                  | 890                                                                                 | 32   |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.93 | 1.00                                                                              |                                                                                   | 0.92 | 0.99                                                                              |                                                                                   | 0.95 | 1.00                                                                                |                                                                                     | 0.95 |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Work Zone On Approach          | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                  |                                                                                     |      |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1900                                                                              | 1796 | 1900                                                                              | 1900                                                                              | 1900 | 1767                                                                              | 1811                                                                              | 1796 | 1811                                                                                | 1826                                                                                | 1900 |
| Adj Flow Rate, veh/h           | 35                                                                                | 11                                                                                | 66   | 31                                                                                | 9                                                                                 | 38   | 71                                                                                | 1003                                                                              | 31   | 18                                                                                  | 908                                                                                 | 33   |
| Peak Hour Factor               | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                                | 0.98                                                                                | 0.98 |
| Percent Heavy Veh, %           | 0                                                                                 | 0                                                                                 | 7    | 0                                                                                 | 0                                                                                 | 0    | 9                                                                                 | 6                                                                                 | 7    | 6                                                                                   | 5                                                                                   | 0    |
| Cap, veh/h                     | 179                                                                               | 22                                                                                | 131  | 149                                                                               | 24                                                                                | 103  | 474                                                                               | 2105                                                                              | 65   | 348                                                                                 | 2029                                                                                | 74   |
| Arrive On Green                | 0.10                                                                              | 0.10                                                                              | 0.10 | 0.08                                                                              | 0.08                                                                              | 0.08 | 0.04                                                                              | 0.62                                                                              | 0.62 | 0.04                                                                                | 1.00                                                                                | 1.00 |
| Sat Flow, veh/h                | 1810                                                                              | 221                                                                               | 1324 | 1810                                                                              | 295                                                                               | 1246 | 1682                                                                              | 3401                                                                              | 105  | 1725                                                                                | 3406                                                                                | 124  |
| Grp Volume(v), veh/h           | 35                                                                                | 0                                                                                 | 77   | 31                                                                                | 0                                                                                 | 47   | 71                                                                                | 507                                                                               | 527  | 18                                                                                  | 462                                                                                 | 479  |
| Grp Sat Flow(s),veh/h/ln       | 1810                                                                              | 0                                                                                 | 1544 | 1810                                                                              | 0                                                                                 | 1542 | 1682                                                                              | 1721                                                                              | 1785 | 1725                                                                                | 1735                                                                                | 1795 |
| Q Serve(g_s), s                | 1.8                                                                               | 0.0                                                                               | 4.7  | 1.6                                                                               | 0.0                                                                               | 2.9  | 1.6                                                                               | 15.9                                                                              | 15.9 | 0.4                                                                                 | 0.0                                                                                 | 0.0  |
| Cycle Q Clear(g_c), s          | 1.8                                                                               | 0.0                                                                               | 4.7  | 1.6                                                                               | 0.0                                                                               | 2.9  | 1.6                                                                               | 15.9                                                                              | 15.9 | 0.4                                                                                 | 0.0                                                                                 | 0.0  |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.86 | 1.00                                                                              |                                                                                   | 0.81 | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                                |                                                                                     | 0.07 |
| Lane Grp Cap(c), veh/h         | 179                                                                               | 0                                                                                 | 153  | 149                                                                               | 0                                                                                 | 127  | 474                                                                               | 1065                                                                              | 1105 | 348                                                                                 | 1033                                                                                | 1069 |
| V/C Ratio(X)                   | 0.20                                                                              | 0.00                                                                              | 0.50 | 0.21                                                                              | 0.00                                                                              | 0.37 | 0.15                                                                              | 0.48                                                                              | 0.48 | 0.05                                                                                | 0.45                                                                                | 0.45 |
| Avail Cap(c_a), veh/h          | 335                                                                               | 0                                                                                 | 286  | 328                                                                               | 0                                                                                 | 279  | 552                                                                               | 1065                                                                              | 1105 | 402                                                                                 | 1033                                                                                | 1069 |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 2.00                                                                                | 2.00                                                                                | 2.00 |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Uniform Delay (d), s/veh       | 41.4                                                                              | 0.0                                                                               | 42.7 | 42.8                                                                              | 0.0                                                                               | 43.4 | 6.8                                                                               | 10.3                                                                              | 10.3 | 8.3                                                                                 | 0.0                                                                                 | 0.0  |
| Incr Delay (d2), s/veh         | 0.5                                                                               | 0.0                                                                               | 2.6  | 0.7                                                                               | 0.0                                                                               | 1.8  | 0.1                                                                               | 1.5                                                                               | 1.5  | 0.1                                                                                 | 1.3                                                                                 | 1.2  |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln       | 0.8                                                                               | 0.0                                                                               | 1.9  | 0.7                                                                               | 0.0                                                                               | 1.2  | 0.5                                                                               | 6.0                                                                               | 6.2  | 0.1                                                                                 | 0.4                                                                                 | 0.4  |
| Unsig. Movement Delay, s/veh   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| LnGrp Delay(d),s/veh           | 41.9                                                                              | 0.0                                                                               | 45.3 | 43.5                                                                              | 0.0                                                                               | 45.2 | 7.0                                                                               | 11.8                                                                              | 11.8 | 8.3                                                                                 | 1.3                                                                                 | 1.2  |
| LnGrp LOS                      | D                                                                                 | A                                                                                 | D    | D                                                                                 | A                                                                                 | D    | A                                                                                 | B                                                                                 | B    | A                                                                                   | A                                                                                   | A    |
| Approach Vol, veh/h            | 112                                                                               |                                                                                   | 78   |                                                                                   |                                                                                   | 1105 |                                                                                   |                                                                                   | 959  |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh          | 44.3                                                                              |                                                                                   | 44.5 |                                                                                   |                                                                                   | 11.5 |                                                                                   |                                                                                   | 1.4  |                                                                                     |                                                                                     |      |
| Approach LOS                   | D                                                                                 |                                                                                   | D    |                                                                                   |                                                                                   | B    |                                                                                   |                                                                                   | A    |                                                                                     |                                                                                     |      |
| Timer - Assigned Phs           | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s       | 6.5                                                                               | 66.4                                                                              | 14.4 |                                                                                   | 8.8                                                                               | 64.1 | 12.8                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s        | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   | 4.5                                                                               | 4.5  | 4.5                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s    | 40.3                                                                              | 40.3                                                                              | 18.5 |                                                                                   | 8.9                                                                               | 36.5 | 18.1                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+11.2), s | 17.9                                                                              | 17.9                                                                              | 6.7  |                                                                                   | 3.6                                                                               | 2.0  | 4.9                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s        | 0.0                                                                               | 7.3                                                                               | 0.3  |                                                                                   | 0.1                                                                               | 7.3  | 0.2                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary           |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th Ctrl Delay             |                                                                                   |                                                                                   | 10.0 |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th LOS                    |                                                                                   |                                                                                   | A    |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |



# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |   |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 34                                                                                | 11                                                                                | 65                                                                                | 30                                                                                | 9                                                                                 | 37                                                                                | 70                                                                                  | 983                                                                                 | 30                                                                                  | 18                                                                                  | 890                                                                                 | 32                                                                                  |
| Future Volume (veh/h)         | 34                                                                                | 11                                                                                | 65                                                                                | 30                                                                                | 9                                                                                 | 37                                                                                | 70                                                                                  | 983                                                                                 | 30                                                                                  | 18                                                                                  | 890                                                                                 | 32                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                              | 0.99                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1900                                                                              | 1796                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1767                                                                                | 1811                                                                                | 1796                                                                                | 1811                                                                                | 1826                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 35                                                                                | 11                                                                                | 66                                                                                | 31                                                                                | 9                                                                                 | 38                                                                                | 71                                                                                  | 1003                                                                                | 31                                                                                  | 18                                                                                  | 908                                                                                 | 33                                                                                  |
| Peak Hour Factor              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Percent Heavy Veh, %          | 0                                                                                 | 0                                                                                 | 7                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 9                                                                                   | 6                                                                                   | 7                                                                                   | 6                                                                                   | 5                                                                                   | 0                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 179                                                                               | 22                                                                                | 131                                                                               | 149                                                                               | 24                                                                                | 103                                                                               | 474                                                                                 | 2105                                                                                | 65                                                                                  | 348                                                                                 | 2029                                                                                | 74                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Prop Arrive On Green          | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.04                                                                                | 0.62                                                                                | 0.62                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 41.9                                                                              | 0.0                                                                               | 45.3                                                                              | 43.5                                                                              | 0.0                                                                               | 45.2                                                                              | 7.0                                                                                 | 11.8                                                                                | 11.8                                                                                | 8.3                                                                                 | 1.3                                                                                 | 1.2                                                                                 |
| Ln Grp LOS                    | D                                                                                 | A                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 112                                                                               |                                                                                   |                                                                                   | 78                                                                                |                                                                                   |                                                                                   | 1105                                                                                |                                                                                     |                                                                                     | 959                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 44.3                                                                              |                                                                                   |                                                                                   | 44.5                                                                              |                                                                                   |                                                                                   | 11.5                                                                                |                                                                                     |                                                                                     | 1.4                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.5                                                                               | 66.4                                                                              | 12.8                                                                              | 14.4                                                                              | 8.8                                                                               | 64.1                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.1                                                                               | 40.3                                                                              | 18.1                                                                              | 18.5                                                                              | 8.9                                                                               | 36.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.3                                                                               | 4.9                                                                               | 5.1                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.4                                                                               | 17.9                                                                              | 4.9                                                                               | 6.7                                                                               | 3.6                                                                               | 2.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 7.3                                                                               | 0.2                                                                               | 0.3                                                                               | 0.1                                                                               | 7.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.39                                                                              | 1.00                                                                              | 0.92                                                                              | 0.97                                                                              | 0.86                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.01                                                                              | 0.17                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1725                                                                              |                                                                                   | 1810                                                                              | 1810                                                                              | 1682                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 3401                                                                              | 295                                                                               | 221                                                                               |                                                                                   | 3406                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 12                                                                                | 18                                                                                | 14                                                                                |                                                                                   | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 105                                                                               | 1246                                                                              | 1324                                                                              |                                                                                   | 124                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

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|                                     |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|
| Lanes in Grp                        | 1    | 0    | 1    | 1    | 1    | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 18   | 0    | 31   | 35   | 71   | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1725 | 0    | 1810 | 1810 | 1682 | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.4  | 0.0  | 1.6  | 1.8  | 1.6  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.4  | 0.0  | 1.6  | 1.8  | 1.6  | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 527  | 0    | 1810 | 1810 | 554  | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 59.6 | 0.0  | 0.0  | 0.0  | 59.6 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 46.0 | 0.0  | 0.0  | 0.0  | 59.6 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 348  | 0    | 149  | 179  | 474  | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.05 | 0.00 | 0.21 | 0.20 | 0.15 | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 402  | 0    | 328  | 335  | 552  | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.92 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 8.3  | 0.0  | 42.8 | 41.4 | 6.8  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1  | 0.0  | 0.7  | 0.5  | 0.1  | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 8.3  | 0.0  | 43.5 | 41.9 | 7.0  | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.1  | 0.0  | 0.7  | 0.8  | 0.5  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.1  | 0.0  | 0.7  | 0.8  | 0.5  | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.03 | 0.00 | 0.25 | 0.27 | 0.10 | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Middle Lane Group Data

|                             |      |      |      |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt               | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment             | T    |      |      |      | T    |      |      |      |
| Lanes in Grp                | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h          | 0    | 507  | 0    | 0    | 0    | 462  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln  | 0    | 1721 | 0    | 0    | 0    | 1735 | 0    | 0    |
| Q Serve Time (g_s), s       | 0.0  | 15.9 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s | 0.0  | 15.9 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h     | 0    | 1065 | 0    | 0    | 0    | 1033 | 0    | 0    |
| V/C Ratio (X)               | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.45 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h      | 0    | 1065 | 0    | 0    | 0    | 1033 | 0    | 0    |
| Upstream Filter (I)         | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh   | 0.0  | 10.3 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh      | 0.0  | 1.5  | 0.0  | 0.0  | 0.0  | 1.3  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh    | 0.0  | 11.8 | 0.0  | 0.0  | 0.0  | 1.3  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln     | 0.0  | 5.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln     | 0.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 6.0  | 0.0  | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 527  | 47   | 77   | 0    | 479  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1785 | 1542 | 1544 | 0    | 1795 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 15.9 | 2.9  | 4.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 15.9 | 2.9  | 4.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.86 | 0.00 | 0.07 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1105 | 127  | 153  | 0    | 1069 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.48 | 0.37 | 0.50 | 0.00 | 0.45 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1105 | 279  | 286  | 0    | 1069 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 10.3 | 43.4 | 42.7 | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.5  | 1.8  | 2.6  | 0.0  | 1.2  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 11.8 | 45.2 | 45.3 | 0.0  | 1.2  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 5.8  | 1.1  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.5  | 0.1  | 0.1  | 0.0  | 0.4  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 6.2  | 1.2  | 1.9  | 0.0  | 0.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.38 | 0.10 | 0.23 | 0.00 | 0.02 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 10.0 |
| HCM 6th LOS        | A    |

| Intersection             |        |       |       |        |      |       |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|-------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 2.3    |       |       |        |      |       |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 6      | 37    | 4     | 10     | 110  | 23    | 23     | 0    | 4     | 6      | 3    | 3    |
| Future Vol, veh/h        | 6      | 37    | 4     | 10     | 110  | 23    | 23     | 0    | 4     | 6      | 3    | 3    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 5     | 6     | 75     | 28   | 0     | 31     | 0    | 67    | 0      | 0    | 0    |
| Mvmt Flow                | 7      | 40    | 4     | 11     | 120  | 25    | 25     | 0    | 4     | 7      | 3    | 3    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 145    | 0     | 0     | 44     | 0    | 0     | 214    | 223  | 42    | 213    | 213  | 133  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 56     | 56   | -     | 155    | 155  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 158    | 167  | -     | 58     | 58   | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.85   | -    | -     | 7.41   | 6.5  | 6.87  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.875  | -    | -     | 3.779  | 4    | 3.903 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1450   | -     | -     | 1201   | -    | -     | 685    | 679  | 871   | 748    | 688  | 922  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 888    | 852  | -     | 852    | 773  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 780    | 764  | -     | 959    | 851  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1450   | -     | -     | 1201   | -    | -     | 672    | 669  | 871   | 736    | 678  | 922  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 672    | 669  | -     | 736    | 678  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 884    | 848  | -     | 848    | 765  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 766    | 756  | -     | 949    | 847  | -    |
| Approach                 | EB     |       |       | WB     |      |       | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 1      |       |       | 0.6    |      |       | 10.4   |      |       | 9.8    |      |      |
| HCM LOS                  |        |       |       |        |      |       | B      |      |       | A      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 672    | 871   | 1450  | -      | -    | 1201  | -      | -    | 758   |        |      |      |
| HCM Lane V/C Ratio       | 0.037  | 0.005 | 0.004 | -      | -    | 0.009 | -      | -    | 0.017 |        |      |      |
| HCM Control Delay (s)    | 10.6   | 9.2   | 7.5   | 0      | -    | 8     | 0      | -    | 9.8   |        |      |      |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -    | A     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -    | 0.1   |        |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

| Intersection             |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 1.6                                                                               |                                                                                   |                                                                                   |        |                                                                                   |       |
| Movement                 | SEL                                                                               | SET                                                                               | NWT                                                                               | NWR    | SWL                                                                               | SWR   |
| Lane Configurations      |  |  |  |        |  |       |
| Traffic Vol, veh/h       | 34                                                                                | 410                                                                               | 869                                                                               | 31     | 30                                                                                | 54    |
| Future Vol, veh/h        | 34                                                                                | 410                                                                               | 869                                                                               | 31     | 30                                                                                | 54    |
| Conflicting Peds, #/hr   | 2                                                                                 | 0                                                                                 | 0                                                                                 | 2      | 0                                                                                 | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free   | Stop                                                                              | Stop  |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None   | -                                                                                 | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -                                                                                 | -      | 0                                                                                 | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | 0                                                                                 | -      | 1                                                                                 | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | 0                                                                                 | -      | 0                                                                                 | -     |
| Peak Hour Factor         | 91                                                                                | 91                                                                                | 91                                                                                | 91     | 91                                                                                | 91    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                 | 2     |
| Mvmt Flow                | 37                                                                                | 451                                                                               | 955                                                                               | 34     | 33                                                                                | 59    |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
| Major/Minor              | Major1                                                                            | Major2                                                                            |                                                                                   | Minor2 |                                                                                   |       |
| Conflicting Flow All     | 991                                                                               | 0                                                                                 | -                                                                                 | 0      | 1499                                                                              | 974   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 974                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 525                                                                               | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -                                                                                 | -      | 6.42                                                                              | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -                                                                                 | -      | 5.42                                                                              | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -                                                                                 | -      | 5.42                                                                              | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -                                                                                 | -      | 3.518                                                                             | 3.318 |
| Pot Cap-1 Maneuver       | 698                                                                               | -                                                                                 | -                                                                                 | -      | 135                                                                               | 306   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 366                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 593                                                                               | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -                                                                                 | -      |                                                                                   |       |
| Mov Cap-1 Maneuver       | 697                                                                               | -                                                                                 | -                                                                                 | -      | 127                                                                               | 305   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -                                                                                 | -      | 252                                                                               | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 346                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 592                                                                               | -     |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
| Approach                 | SE                                                                                | NW                                                                                |                                                                                   | SW     |                                                                                   |       |
| HCM Control Delay, s     | 0.8                                                                               | 0                                                                                 |                                                                                   | 23.7   |                                                                                   |       |
| HCM LOS                  | C                                                                                 |                                                                                   |                                                                                   |        |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
| Minor Lane/Major Mvmt    |                                                                                   | NWT                                                                               | NWR                                                                               | SEL    | SETSWLn1                                                                          |       |
| Capacity (veh/h)         |                                                                                   | -                                                                                 | -                                                                                 | 697    | -                                                                                 | 284   |
| HCM Lane V/C Ratio       |                                                                                   | -                                                                                 | -                                                                                 | 0.054  | -                                                                                 | 0.325 |
| HCM Control Delay (s)    |                                                                                   | -                                                                                 | -                                                                                 | 10.5   | -                                                                                 | 23.7  |
| HCM Lane LOS             |                                                                                   | -                                                                                 | -                                                                                 | B      | -                                                                                 | C     |
| HCM 95th %tile Q(veh)    |                                                                                   | -                                                                                 | -                                                                                 | 0.2    | -                                                                                 | 1.4   |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 2.4                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 5                                                                                 | 391                                                                               | 82                                                                                | 6                                                                                 | 806                                                                               | 11   | 72   | 1                                                                                 | 1    | 15   | 2                                                                                   | 30                                                                                  |
| Future Vol, veh/h        | 5                                                                                 | 391                                                                               | 82                                                                                | 6                                                                                 | 806                                                                               | 11   | 72   | 1                                                                                 | 1    | 15   | 2                                                                                   | 30                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 2                                                                                 | 4                                                                                 | 0                                                                                 | 1                                                                                 | 0    | 4    | 0                                                                                 | 0    | 0    | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 6                                                                                 | 439                                                                               | 92                                                                                | 7                                                                                 | 906                                                                               | 12   | 81   | 1                                                                                 | 1    | 17   | 2                                                                                   | 34                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |     | Minor2 |      |     |
|----------------------|--------|---|---|--------|---|---|--------|------|-----|--------|------|-----|
| Conflicting Flow All | 918    | 0 | 0 | 533    | 0 | 0 | 1398   | 1385 | 441 | 1424   | 1471 | 913 |
| Stage 1              | -      | - | - | -      | - | - | 453    | 453  | -   | 926    | 926  | -   |
| Stage 2              | -      | - | - | -      | - | - | 945    | 932  | -   | 498    | 545  | -   |
| Critical Hdwy        | 4.1    | - | - | 4.1    | - | - | 7.14   | 6.5  | 6.2 | 7.1    | 6.5  | 6.2 |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.14   | 5.5  | -   | 6.1    | 5.5  | -   |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.14   | 5.5  | -   | 6.1    | 5.5  | -   |
| Follow-up Hdwy       | 2.2    | - | - | 2.2    | - | - | 3.536  | 4    | 3.3 | 3.5    | 4    | 3.3 |
| Pot Cap-1 Maneuver   | 752    | - | - | 1045   | - | - | 117    | 145  | 621 | 115    | 128  | 334 |
| Stage 1              | -      | - | - | -      | - | - | 582    | 573  | -   | 325    | 350  | -   |
| Stage 2              | -      | - | - | -      | - | - | 312    | 348  | -   | 558    | 522  | -   |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -    | -   | -      | -    | -   |
| Mov Cap-1 Maneuver   | 752    | - | - | 1043   | - | - | 103    | 143  | 620 | 113    | 126  | 334 |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 207    | 253  | -   | 232    | 243  | -   |
| Stage 1              | -      | - | - | -      | - | - | 576    | 567  | -   | 322    | 348  | -   |
| Stage 2              | -      | - | - | -      | - | - | 277    | 346  | -   | 551    | 517  | -   |

| Approach             | EB  |  |  | WB  |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 0.1 |  |  | 0.1 |  |  | 33.2 |  |  | 18.7 |  |  |
| HCM LOS              |     |  |  |     |  |  | D    |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 209   | 752   | -   | -   | 1043  | -   | -   | 233   | 334   |
| HCM Lane V/C Ratio    | 0.398 | 0.007 | -   | -   | 0.006 | -   | -   | 0.082 | 0.101 |
| HCM Control Delay (s) | 33.2  | 9.8   | -   | -   | 8.5   | -   | -   | 21.8  | 17    |
| HCM Lane LOS          | D     | A     | -   | -   | A     | -   | -   | C     | C     |
| HCM 95th %tile Q(veh) | 1.8   | 0     | -   | -   | 0     | -   | -   | 0.3   | 0.3   |

Intersection

Intersection Delay, s/veh 10.1

Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 29   | 178  | 60   | 25   | 149  | 62   | 42   | 9    | 28   | 34   | 18   | 20   |
| Future Vol, veh/h   | 29   | 178  | 60   | 25   | 149  | 62   | 42   | 9    | 28   | 34   | 18   | 20   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 0    | 1    | 12   | 0    | 2    | 0    | 11   | 13   | 0    | 3    | 0    | 0    |
| Mvmt Flow           | 34   | 207  | 70   | 29   | 173  | 72   | 49   | 10   | 33   | 40   | 21   | 23   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB  | SB  |
|----------------------------|------|------|-----|-----|
| Opposing Approach          | WB   | EB   | SB  | NB  |
| Opposing Lanes             | 1    | 1    | 1   | 1   |
| Conflicting Approach Left  | SB   | NB   | EB  | WB  |
| Conflicting Lanes Left     | 1    | 1    | 1   | 1   |
| Conflicting Approach Right | NB   | SB   | WB  | EB  |
| Conflicting Lanes Right    | 1    | 1    | 1   | 1   |
| HCM Control Delay          | 10.6 | 10.1 | 9.4 | 9.2 |
| HCM LOS                    | B    | B    | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 53%   | 11%   | 11%   | 47%   |
| Vol Thru, %            | 11%   | 67%   | 63%   | 25%   |
| Vol Right, %           | 35%   | 22%   | 26%   | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 79    | 267   | 236   | 72    |
| LT Vol                 | 42    | 29    | 25    | 34    |
| Through Vol            | 9     | 178   | 149   | 18    |
| RT Vol                 | 28    | 60    | 62    | 20    |
| Lane Flow Rate         | 92    | 310   | 274   | 84    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.138 | 0.394 | 0.35  | 0.124 |
| Departure Headway (Hd) | 5.416 | 4.568 | 4.585 | 5.33  |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 655   | 782   | 779   | 666   |
| Service Time           | 3.505 | 2.625 | 2.644 | 3.419 |
| HCM Lane V/C Ratio     | 0.14  | 0.396 | 0.352 | 0.126 |
| HCM Control Delay      | 9.4   | 10.6  | 10.1  | 9.2   |
| HCM Lane LOS           | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.5   | 1.9   | 1.6   | 0.4   |



Intersection

Intersection Delay, s/veh 8  
Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 13   | 62   | 15   | 17   | 44   | 40   | 0    | 0    | 0    | 51   | 37   | 16   |
| Future Vol, veh/h   | 13   | 62   | 15   | 17   | 44   | 40   | 0    | 0    | 0    | 51   | 37   | 16   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 0    | 2    | 0    | 0    | 2    | 14   | 0    | 0    | 0    | 9    | 0    | 7    |
| Mvmt Flow           | 15   | 72   | 17   | 20   | 51   | 47   | 0    | 0    | 0    | 59   | 43   | 19   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB  |
|----------------------------|-----|-----|----|-----|
| Opposing Approach          | WB  | EB  | SB | NB  |
| Opposing Lanes             | 1   | 1   | 1  | 1   |
| Conflicting Approach Left  | SB  | NB  | EB | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1   |
| Conflicting Approach Right | NB  | SB  | WB | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1   |
| HCM Control Delay          | 7.8 | 7.7 | 0  | 8.4 |
| HCM LOS                    | A   | A   | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 17%   | 49%   |
| Vol Thru, %            | 100%  | 69%   | 44%   | 36%   |
| Vol Right, %           | 0%    | 17%   | 40%   | 15%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 90    | 101   | 104   |
| LT Vol                 | 0     | 13    | 17    | 51    |
| Through Vol            | 0     | 62    | 44    | 37    |
| RT Vol                 | 0     | 15    | 40    | 16    |
| Lane Flow Rate         | 0     | 105   | 117   | 121   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.123 | 0.134 | 0.153 |
| Departure Headway (Hd) | 4.522 | 4.239 | 4.097 | 4.55  |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 849   | 878   | 793   |
| Service Time           | 2.539 | 2.251 | 2.107 | 2.55  |
| HCM Lane V/C Ratio     | 0     | 0.124 | 0.133 | 0.153 |
| HCM Control Delay      | 7.5   | 7.8   | 7.7   | 8.4   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.5   | 0.5   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                       | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations            |  |  |      |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)         | 46                                                                                | 12                                                                                | 49   | 30                                                                                | 16                                                                                | 89    | 43                                                                                | 1684                                                                              | 15   | 23                                                                                  | 818                                                                                 | 23   |
| Future Volume (veh/h)          | 46                                                                                | 12                                                                                | 49   | 30                                                                                | 16                                                                                | 89    | 43                                                                                | 1684                                                                              | 15   | 23                                                                                  | 818                                                                                 | 23   |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.91 | 1.00                                                                              |                                                                                   | 0.92  | 1.00                                                                              |                                                                                   | 0.97 | 1.00                                                                                |                                                                                     | 0.97 |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Work Zone On Approach          | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |       | No                                                                                |                                                                                   |      | No                                                                                  |                                                                                     |      |
| Adj Sat Flow, veh/h/ln         | 1870                                                                              | 1900                                                                              | 1781 | 1856                                                                              | 1900                                                                              | 1900  | 1826                                                                              | 1870                                                                              | 1900 | 1900                                                                                | 1870                                                                                | 1767 |
| Adj Flow Rate, veh/h           | 47                                                                                | 12                                                                                | 51   | 31                                                                                | 16                                                                                | 92    | 44                                                                                | 1736                                                                              | 15   | 24                                                                                  | 843                                                                                 | 24   |
| Peak Hour Factor               | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                              | 0.97                                                                              | 0.97  | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                                | 0.97                                                                                | 0.97 |
| Percent Heavy Veh, %           | 2                                                                                 | 0                                                                                 | 8    | 3                                                                                 | 0                                                                                 | 0     | 5                                                                                 | 2                                                                                 | 0    | 0                                                                                   | 2                                                                                   | 9    |
| Cap, veh/h                     | 134                                                                               | 22                                                                                | 93   | 163                                                                               | 21                                                                                | 121   | 465                                                                               | 2551                                                                              | 22   | 200                                                                                 | 2472                                                                                | 70   |
| Arrive On Green                | 0.08                                                                              | 0.08                                                                              | 0.08 | 0.09                                                                              | 0.09                                                                              | 0.09  | 0.03                                                                              | 0.71                                                                              | 0.71 | 0.02                                                                                | 0.70                                                                                | 0.70 |
| Sat Flow, veh/h                | 1781                                                                              | 291                                                                               | 1238 | 1767                                                                              | 228                                                                               | 1311  | 1739                                                                              | 3609                                                                              | 31   | 1810                                                                                | 3526                                                                                | 100  |
| Grp Volume(v), veh/h           | 47                                                                                | 0                                                                                 | 63   | 31                                                                                | 0                                                                                 | 108   | 44                                                                                | 854                                                                               | 897  | 24                                                                                  | 425                                                                                 | 442  |
| Grp Sat Flow(s),veh/h/ln       | 1781                                                                              | 0                                                                                 | 1530 | 1767                                                                              | 0                                                                                 | 1539  | 1739                                                                              | 1777                                                                              | 1864 | 1810                                                                                | 1777                                                                                | 1849 |
| Q Serve(g_s), s                | 4.3                                                                               | 0.0                                                                               | 6.8  | 2.8                                                                               | 0.0                                                                               | 11.7  | 1.2                                                                               | 46.1                                                                              | 46.3 | 0.6                                                                                 | 16.0                                                                                | 16.0 |
| Cycle Q Clear(g_c), s          | 4.3                                                                               | 0.0                                                                               | 6.8  | 2.8                                                                               | 0.0                                                                               | 11.7  | 1.2                                                                               | 46.1                                                                              | 46.3 | 0.6                                                                                 | 16.0                                                                                | 16.0 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.81 | 1.00                                                                              |                                                                                   | 0.85  | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                                |                                                                                     | 0.05 |
| Lane Grp Cap(c), veh/h         | 134                                                                               | 0                                                                                 | 115  | 163                                                                               | 0                                                                                 | 142   | 465                                                                               | 1256                                                                              | 1317 | 200                                                                                 | 1246                                                                                | 1296 |
| V/C Ratio(X)                   | 0.35                                                                              | 0.00                                                                              | 0.55 | 0.19                                                                              | 0.00                                                                              | 0.76  | 0.09                                                                              | 0.68                                                                              | 0.68 | 0.12                                                                                | 0.34                                                                                | 0.34 |
| Avail Cap(c_a), veh/h          | 194                                                                               | 0                                                                                 | 166  | 194                                                                               | 0                                                                                 | 169   | 479                                                                               | 1256                                                                              | 1317 | 233                                                                                 | 1246                                                                                | 1296 |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.95                                                                                | 0.95                                                                                | 0.95 |
| Uniform Delay (d), s/veh       | 74.6                                                                              | 0.0                                                                               | 75.8 | 71.3                                                                              | 0.0                                                                               | 75.4  | 7.3                                                                               | 14.1                                                                              | 14.1 | 13.3                                                                                | 10.0                                                                                | 10.0 |
| Incr Delay (d2), s/veh         | 1.6                                                                               | 0.0                                                                               | 4.0  | 0.6                                                                               | 0.0                                                                               | 15.5  | 0.1                                                                               | 3.0                                                                               | 2.9  | 0.3                                                                                 | 0.7                                                                                 | 0.7  |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln       | 2.0                                                                               | 0.0                                                                               | 2.8  | 1.3                                                                               | 0.0                                                                               | 5.3   | 0.5                                                                               | 19.1                                                                              | 20.0 | 0.3                                                                                 | 6.5                                                                                 | 6.8  |
| Unsig. Movement Delay, s/veh   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| LnGrp Delay(d),s/veh           | 76.2                                                                              | 0.0                                                                               | 79.8 | 71.9                                                                              | 0.0                                                                               | 90.8  | 7.4                                                                               | 17.0                                                                              | 17.0 | 13.6                                                                                | 10.7                                                                                | 10.7 |
| LnGrp LOS                      | E                                                                                 | A                                                                                 | E    | E                                                                                 | A                                                                                 | F     | A                                                                                 | B                                                                                 | B    | B                                                                                   | B                                                                                   | B    |
| Approach Vol, veh/h            | 110                                                                               |                                                                                   | 139  |                                                                                   |                                                                                   | 1795  |                                                                                   |                                                                                   | 891  |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh          | 78.3                                                                              |                                                                                   | 86.6 |                                                                                   |                                                                                   | 16.8  |                                                                                   |                                                                                   | 10.8 |                                                                                     |                                                                                     |      |
| Approach LOS                   | E                                                                                 |                                                                                   | F    |                                                                                   |                                                                                   | B     |                                                                                   |                                                                                   | B    |                                                                                     |                                                                                     |      |
| Timer - Assigned Phs           | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s       | 7.9                                                                               | 124.7                                                                             | 17.3 |                                                                                   | 8.9                                                                               | 123.7 | 20.1                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s        | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   | 4.5                                                                               | 4.5   | 4.5                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s    | 6.5                                                                               | 108.3                                                                             | 18.5 |                                                                                   | 5.7                                                                               | 109.1 | 18.7                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+12.6), s | 12.6                                                                              | 48.3                                                                              | 8.8  |                                                                                   | 3.2                                                                               | 18.0  | 13.7                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s        | 0.0                                                                               | 23.9                                                                              | 0.3  |                                                                                   | 0.0                                                                               | 6.8   | 0.3                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary           |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th Ctrl Delay             |                                                                                   |                                                                                   | 20.5 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th LOS                    |                                                                                   |                                                                                   | C    |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 46                                                                                | 12                                                                                | 49                                                                                | 30                                                                                | 16                                                                                | 89                                                                                | 43                                                                                  | 1684                                                                                | 15                                                                                  | 23                                                                                  | 818                                                                                 | 23                                                                                  |
| Future Volume (veh/h)         | 46                                                                                | 12                                                                                | 49                                                                                | 30                                                                                | 16                                                                                | 89                                                                                | 43                                                                                  | 1684                                                                                | 15                                                                                  | 23                                                                                  | 818                                                                                 | 23                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.91                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1900                                                                              | 1781                                                                              | 1856                                                                              | 1900                                                                              | 1900                                                                              | 1826                                                                                | 1870                                                                                | 1900                                                                                | 1900                                                                                | 1870                                                                                | 1767                                                                                |
| Adj Flow Rate, veh/h          | 47                                                                                | 12                                                                                | 51                                                                                | 31                                                                                | 16                                                                                | 92                                                                                | 44                                                                                  | 1736                                                                                | 15                                                                                  | 24                                                                                  | 843                                                                                 | 24                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 0                                                                                 | 8                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                   | 2                                                                                   | 0                                                                                   | 0                                                                                   | 2                                                                                   | 9                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 134                                                                               | 22                                                                                | 93                                                                                | 163                                                                               | 21                                                                                | 121                                                                               | 465                                                                                 | 2551                                                                                | 22                                                                                  | 200                                                                                 | 2472                                                                                | 70                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.03                                                                                | 0.71                                                                                | 0.71                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 76.2                                                                              | 0.0                                                                               | 79.8                                                                              | 71.9                                                                              | 0.0                                                                               | 90.8                                                                              | 7.4                                                                                 | 17.0                                                                                | 17.0                                                                                | 13.6                                                                                | 10.7                                                                                | 10.7                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | E                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 110                                                                               |                                                                                   |                                                                                   | 139                                                                               |                                                                                   |                                                                                   | 1795                                                                                |                                                                                     |                                                                                     | 891                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.3                                                                              |                                                                                   |                                                                                   | 86.6                                                                              |                                                                                   |                                                                                   | 16.8                                                                                |                                                                                     |                                                                                     | 10.8                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 7.9                                                                               |                                                                                   | 124.7                                                                             | 20.1                                                                              | 17.3                                                                              | 8.9                                                                               | 123.7                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              | 18.5                                                                              | 5.7                                                                               | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.2                                                                               | 5.3                                                                               | 4.9                                                                               | 3.8                                                                               | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.6                                                                               |                                                                                   | 48.3                                                                              | 13.7                                                                              | 8.8                                                                               | 3.2                                                                               | 18.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 23.9                                                                              | 0.3                                                                               | 0.3                                                                               | 0.0                                                                               | 6.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.68                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.87                                                                              | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 0.90                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              | 0.03                                                                              | 1.00                                                                              | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1810                                                                              |                                                                                   | 1767                                                                              |                                                                                   | 1781                                                                              | 1739                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3609                                                                              |                                                                                   | 228                                                                               |                                                                                   | 291                                                                               | 3526                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 31                                                                                |                                                                                   | 1311                                                                              |                                                                                   | 1238                                                                              | 100                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

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|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 24    | 0    | 31   | 47   | 44    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1810  | 0    | 1767 | 1781 | 1739  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.6   | 0.0  | 2.8  | 4.3  | 1.2   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.6   | 0.0  | 2.8  | 4.3  | 1.2   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 279   | 0    | 1767 | 1781 | 623   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 119.2 | 0.0  | 0.0  | 0.0  | 119.2 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 73.9  | 0.0  | 0.0  | 0.0  | 103.2 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 4.3   | 0.0  | 0.0  | 0.0  | 1.2   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 200   | 0    | 163  | 134  | 465   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.12  | 0.00 | 0.19 | 0.35 | 0.09  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 233   | 0    | 194  | 194  | 479   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 13.3  | 0.0  | 71.3 | 74.6 | 7.3   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.3   | 0.0  | 0.6  | 1.6  | 0.1   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 13.6  | 0.0  | 71.9 | 76.2 | 7.4   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.3   | 0.0  | 1.3  | 2.0  | 0.5   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.3   | 0.0  | 1.3  | 2.0  | 0.5   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.05  | 0.00 | 0.44 | 0.69 | 0.08  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      | T    |       |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 854  | 0    | 0    | 0     | 425  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1777 | 0    | 0    | 0     | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 46.1 | 0.0  | 0.0  | 0.0   | 16.0 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 46.1 | 0.0  | 0.0  | 0.0   | 16.0 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1256 | 0    | 0    | 0     | 1246 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.68 | 0.00 | 0.00 | 0.00  | 0.34 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1256 | 0    | 0    | 0     | 1246 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 14.1 | 0.0  | 0.0  | 0.0   | 10.0 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 3.0  | 0.0  | 0.0  | 0.0   | 0.7  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 17.0 | 0.0  | 0.0  | 0.0   | 10.7 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 18.0 | 0.0  | 0.0  | 0.0   | 6.3  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 1.0  | 0.0  | 0.0  | 0.0   | 0.2  | 0.0  | 0.0  |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

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|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 19.1 | 0.0  | 0.0  | 0.0  | 6.5  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.12 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 897  | 108  | 63   | 0    | 442  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1864 | 1539 | 1530 | 0    | 1849 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 46.3 | 11.7 | 6.8  | 0.0  | 16.0 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 46.3 | 11.7 | 6.8  | 0.0  | 16.0 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.81 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1317 | 142  | 115  | 0    | 1296 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.68 | 0.76 | 0.55 | 0.00 | 0.34 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1317 | 169  | 166  | 0    | 1296 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 14.1 | 75.4 | 75.8 | 0.0  | 10.0 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 2.9  | 15.5 | 4.0  | 0.0  | 0.7  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 17.0 | 90.8 | 79.8 | 0.0  | 10.7 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 19.0 | 4.6  | 2.7  | 0.0  | 6.5  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.0  | 0.6  | 0.1  | 0.0  | 0.2  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 20.0 | 5.3  | 2.8  | 0.0  | 6.8  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.17 | 0.47 | 0.33 | 0.00 | 0.42 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 20.5 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|-------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 2.7    |       |       |        |      |       |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 4      | 75    | 6     | 1      | 55   | 0     | 18     | 3    | 4     | 13     | 2    | 13   |
| Future Vol, veh/h        | 4      | 75    | 6     | 1      | 55   | 0     | 18     | 3    | 4     | 13     | 2    | 13   |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 33    | 6     | 0      | 12   | 0     | 12     | 0    | 0     | 0      | 0    | 0    |
| Mvmt Flow                | 4      | 82    | 7     | 1      | 60   | 0     | 20     | 3    | 4     | 14     | 2    | 14   |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 60     | 0     | 0     | 89     | 0    | 0     | 164    | 156  | 86    | 159    | 159  | 60   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 94     | 94   | -     | 62     | 62   | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 70     | 62   | -     | 97     | 97   | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.1    | -    | -     | 7.22   | 6.5  | 6.2   | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.22   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.22   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.2    | -    | -     | 3.608  | 4    | 3.3   | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1556   | -     | -     | 1519   | -    | -     | 779    | 740  | 978   | 811    | 737  | 1011 |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 889    | 821  | -     | 954    | 847  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 915    | 847  | -     | 914    | 819  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1556   | -     | -     | 1519   | -    | -     | 764    | 737  | 978   | 802    | 734  | 1011 |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 764    | 737  | -     | 802    | 734  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 886    | 819  | -     | 951    | 846  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 899    | 846  | -     | 904    | 817  | -    |
| Approach                 | EB     |       |       | WB     |      |       | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.3    |       |       | 0.1    |      |       | 9.7    |      |       | 9.2    |      |      |
| HCM LOS                  |        |       |       |        |      |       | A      |      |       | A      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 760    | 978   | 1556  | -      | -    | 1519  | -      | -    | 881   |        |      |      |
| HCM Lane V/C Ratio       | 0.03   | 0.004 | 0.003 | -      | -    | 0.001 | -      | -    | 0.035 |        |      |      |
| HCM Control Delay (s)    | 9.9    | 8.7   | 7.3   | 0      | -    | 7.4   | 0      | -    | 9.2   |        |      |      |
| HCM Lane LOS             | A      | A     | A     | A      | -    | A     | A      | -    | A     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -    | 0.1   |        |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

Intersection

Int Delay, s/veh 0.8

Movement SEL SET NWT NWR SWL SWR

Lane Configurations 

Traffic Vol, veh/h 59 1200 518 13 21 15

Future Vol, veh/h 59 1200 518 13 21 15

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length 100 - - - 0 -

Veh in Median Storage, # - 0 0 - 1 -

Grade, % - 0 0 - 0 -

Peak Hour Factor 90 90 90 90 90 90

Heavy Vehicles, % 2 2 2 2 2 2

Mvmt Flow 66 1333 576 14 23 17

Major/Minor Major1 Major2 Minor2

Conflicting Flow All 590 0 - 0 2048 583

Stage 1 - - - - 583 -

Stage 2 - - - - 1465 -

Critical Hdwy 4.12 - - - 6.42 6.22

Critical Hdwy Stg 1 - - - - 5.42 -

Critical Hdwy Stg 2 - - - - 5.42 -

Follow-up Hdwy 2.218 - - - 3.518 3.318

Pot Cap-1 Maneuver 985 - - - 61 512

Stage 1 - - - - 558 -

Stage 2 - - - - 212 -

Platoon blocked, % - - - -

Mov Cap-1 Maneuver 985 - - - 57 512

Mov Cap-2 Maneuver - - - - 158 -

Stage 1 - - - - 521 -

Stage 2 - - - - 212 -

Approach SE NW SW

HCM Control Delay, s 0.4 0 24.7

HCM LOS C

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h) - - 985 - 222

HCM Lane V/C Ratio - - 0.067 - 0.18

HCM Control Delay (s) - - 8.9 - 24.7

HCM Lane LOS - - A - C

HCM 95th %tile Q(veh) - - 0.2 - 0.6



HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |        |                                                                                   |       |                                |                                                                                     |                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------|--------|-----------------------------------------------------------------------------------|-------|--------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh           | 34.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |        |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Movement                   | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                        | NBL    | NBT                                                                               | NBR   | SBL                            | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |  |  |  |  |  |                            |        |  |       |                                |  |  |
| Traffic Vol, veh/h         | 40                                                                                | 908                                                                               | 148                                                                               | 2                                                                                 | 387                                                                               | 28                         | 205    | 0                                                                                 | 5     | 13                             | 4                                                                                   | 12                                                                                  |
| Future Vol, veh/h          | 40                                                                                | 908                                                                               | 148                                                                               | 2                                                                                 | 387                                                                               | 28                         | 205    | 0                                                                                 | 5     | 13                             | 4                                                                                   | 12                                                                                  |
| Conflicting Peds, #/hr     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                          | 0      | 0                                                                                 | 0     | 0                              | 0                                                                                   | 0                                                                                   |
| Sign Control               | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                       | Stop   | Stop                                                                              | Stop  | Stop                           | Stop                                                                                | Stop                                                                                |
| RT Channelized             | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None                       | -      | -                                                                                 | None  | -                              | -                                                                                   | None                                                                                |
| Storage Length             | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -                          | -      | -                                                                                 | -     | -                              | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, #   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                          | -      | 1                                                                                 | -     | -                              | 1                                                                                   | -                                                                                   |
| Grade, %                   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                          | -      | 0                                                                                 | -     | -                              | 0                                                                                   | -                                                                                   |
| Peak Hour Factor           | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                         | 88     | 88                                                                                | 88    | 88                             | 88                                                                                  | 88                                                                                  |
| Heavy Vehicles, %          | 0                                                                                 | 3                                                                                 | 4                                                                                 | 0                                                                                 | 2                                                                                 | 0                          | 24     | 0                                                                                 | 0     | 60                             | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                  | 45                                                                                | 1032                                                                              | 168                                                                               | 2                                                                                 | 440                                                                               | 32                         | 233    | 0                                                                                 | 6     | 15                             | 5                                                                                   | 14                                                                                  |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |        |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Major/Minor                | Major1                                                                            |                                                                                   |                                                                                   | Major2                                                                            |                                                                                   |                            | Minor1 |                                                                                   |       | Minor2                         |                                                                                     |                                                                                     |
| Conflicting Flow All       | 472                                                                               | 0                                                                                 | 0                                                                                 | 1200                                                                              | 0                                                                                 | 0                          | 1592   | 1598                                                                              | 1032  | 1669                           | 1750                                                                                | 456                                                                                 |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 1122   | 1122                                                                              | -     | 460                            | 460                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 470    | 476                                                                               | -     | 1209                           | 1290                                                                                | -                                                                                   |
| Critical Hdwy              | 4.1                                                                               | -                                                                                 | -                                                                                 | 4.1                                                                               | -                                                                                 | -                          | 7.34   | 6.5                                                                               | 6.2   | 7.7                            | 6.5                                                                                 | 6.2                                                                                 |
| Critical Hdwy Stg 1        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 6.34   | 5.5                                                                               | -     | 6.7                            | 5.5                                                                                 | -                                                                                   |
| Critical Hdwy Stg 2        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 6.34   | 5.5                                                                               | -     | 6.7                            | 5.5                                                                                 | -                                                                                   |
| Follow-up Hdwy             | 2.2                                                                               | -                                                                                 | -                                                                                 | 2.2                                                                               | -                                                                                 | -                          | 3.716  | 4                                                                                 | 3.3   | 4.04                           | 4                                                                                   | 3.3                                                                                 |
| Pot Cap-1 Maneuver         | 1100                                                                              | -                                                                                 | -                                                                                 | 589                                                                               | -                                                                                 | -                          | ~ 77   | 107                                                                               | 285   | 56                             | 87                                                                                  | 609                                                                                 |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | ~ 227  | 284                                                                               | -     | 485                            | 569                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 534    | 560                                                                               | -     | 172                            | 236                                                                                 | -                                                                                   |
| Platoon blocked, %         |                                                                                   | -                                                                                 | -                                                                                 |                                                                                   | -                                                                                 | -                          |        |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Mov Cap-1 Maneuver         | 1100                                                                              | -                                                                                 | -                                                                                 | 589                                                                               | -                                                                                 | -                          | ~ 71   | 102                                                                               | 285   | 53                             | 83                                                                                  | 609                                                                                 |
| Mov Cap-2 Maneuver         | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | ~ 163  | 203                                                                               | -     | 126                            | 175                                                                                 | -                                                                                   |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | ~ 218  | 272                                                                               | -     | 465                            | 567                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 516    | 558                                                                               | -     | 162                            | 226                                                                                 | -                                                                                   |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |        |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Approach                   | EB                                                                                |                                                                                   |                                                                                   | WB                                                                                |                                                                                   |                            | NB     |                                                                                   |       | SB                             |                                                                                     |                                                                                     |
| HCM Control Delay, s       | 0.3                                                                               |                                                                                   |                                                                                   | 0.1                                                                               |                                                                                   |                            | 283.1  |                                                                                   |       | 25.7                           |                                                                                     |                                                                                     |
| HCM LOS                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            | F      |                                                                                   |       | D                              |                                                                                     |                                                                                     |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |        |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt      | NBLn1                                                                             | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                        | WBR    | SBLn1                                                                             | SBLn2 |                                |                                                                                     |                                                                                     |
| Capacity (veh/h)           | 165                                                                               | 1100                                                                              | -                                                                                 | -                                                                                 | 589                                                                               | -                          | -      | 135                                                                               | 609   |                                |                                                                                     |                                                                                     |
| HCM Lane V/C Ratio         | 1.446                                                                             | 0.041                                                                             | -                                                                                 | -                                                                                 | 0.004                                                                             | -                          | -      | 0.143                                                                             | 0.022 |                                |                                                                                     |                                                                                     |
| HCM Control Delay (s)      | 283.1                                                                             | 8.4                                                                               | -                                                                                 | -                                                                                 | 11.1                                                                              | -                          | -      | 36.1                                                                              | 11    |                                |                                                                                     |                                                                                     |
| HCM Lane LOS               | F                                                                                 | A                                                                                 | -                                                                                 | -                                                                                 | B                                                                                 | -                          | -      | E                                                                                 | B     |                                |                                                                                     |                                                                                     |
| HCM 95th %tile Q(veh)      | 15.1                                                                              | 0.1                                                                               | -                                                                                 | -                                                                                 | 0                                                                                 | -                          | -      | 0.5                                                                               | 0.1   |                                |                                                                                     |                                                                                     |
| Notes                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |        |                                                                                   |       |                                |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity |                                                                                   | \$: Delay exceeds 300s                                                            |                                                                                   |                                                                                   |                                                                                   | +: Computation Not Defined |        |                                                                                   |       | *: All major volume in platoon |                                                                                     |                                                                                     |

Intersection

Intersection Delay, s/veh 16.3

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 13   | 376  | 54   | 119  | 247  | 71   | 40   | 17   | 18   | 19   | 24   | 21   |
| Future Vol, veh/h   | 13   | 376  | 54   | 119  | 247  | 71   | 40   | 17   | 18   | 19   | 24   | 21   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 0    | 2    | 12   | 2    | 4    | 0    | 11   | 0    | 0    | 0    | 0    | 0    |
| Mvmt Flow           | 14   | 409  | 59   | 129  | 268  | 77   | 43   | 18   | 20   | 21   | 26   | 23   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 17.2 | 17.3 | 10.7 | 10.2 |
| HCM LOS                    | C    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 53%   | 3%    | 27%   | 30%   |
| Vol Thru, %            | 23%   | 85%   | 57%   | 38%   |
| Vol Right, %           | 24%   | 12%   | 16%   | 33%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 75    | 443   | 437   | 64    |
| LT Vol                 | 40    | 13    | 119   | 19    |
| Through Vol            | 17    | 376   | 247   | 24    |
| RT Vol                 | 18    | 54    | 71    | 21    |
| Lane Flow Rate         | 82    | 482   | 475   | 70    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.147 | 0.662 | 0.661 | 0.121 |
| Departure Headway (Hd) | 6.513 | 4.952 | 5.012 | 6.265 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 549   | 732   | 722   | 570   |
| Service Time           | 4.566 | 2.984 | 3.044 | 4.319 |
| HCM Lane V/C Ratio     | 0.149 | 0.658 | 0.658 | 0.123 |
| HCM Control Delay      | 10.7  | 17.2  | 17.3  | 10.2  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.5   | 5     | 5     | 0.4   |

Intersection

Intersection Delay, s/veh 9  
Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 26   | 32   | 16   | 11   | 34   | 66   | 2    | 0    | 0    | 68   | 140  | 34   |
| Future Vol, veh/h   | 26   | 32   | 16   | 11   | 34   | 66   | 2    | 0    | 0    | 68   | 140  | 34   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 0    | 12   | 0    | 0    | 4    | 11   | 0    | 0    | 0    | 11   | 1    | 4    |
| Mvmt Flow           | 28   | 34   | 17   | 12   | 37   | 71   | 2    | 0    | 0    | 73   | 151  | 37   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB | NB  | SB  |
|----------------------------|-----|----|-----|-----|
| Opposing Approach          | WB  | EB | SB  | NB  |
| Opposing Lanes             | 1   | 1  | 1   | 1   |
| Conflicting Approach Left  | SB  | NB | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1  | 1   | 1   |
| Conflicting Approach Right | NB  | SB | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1  | 1   | 1   |
| HCM Control Delay          | 8.1 | 8  | 7.9 | 9.7 |
| HCM LOS                    | A   | A  | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 10%   | 28%   |
| Vol Thru, %            | 0%    | 43%   | 31%   | 58%   |
| Vol Right, %           | 0%    | 22%   | 59%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 2     | 74    | 111   | 242   |
| LT Vol                 | 2     | 26    | 11    | 68    |
| Through Vol            | 0     | 32    | 34    | 140   |
| RT Vol                 | 0     | 16    | 66    | 34    |
| Lane Flow Rate         | 2     | 80    | 119   | 260   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.003 | 0.102 | 0.142 | 0.326 |
| Departure Headway (Hd) | 4.848 | 4.6   | 4.284 | 4.508 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 738   | 780   | 838   | 799   |
| Service Time           | 2.88  | 2.623 | 2.305 | 2.531 |
| HCM Lane V/C Ratio     | 0.003 | 0.103 | 0.142 | 0.325 |
| HCM Control Delay      | 7.9   | 8.1   | 8     | 9.7   |
| HCM Lane LOS           | A     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.3   | 0.5   | 1.4   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                       | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations            |  |  |      |  |  |      |  |  |      |  |  |      |
| Traffic Volume (veh/h)         | 35                                                                                | 11                                                                                | 66   | 30                                                                                | 9                                                                                 | 38   | 72                                                                                | 1038                                                                              | 30   | 18                                                                                  | 981                                                                                 | 33   |
| Future Volume (veh/h)          | 35                                                                                | 11                                                                                | 66   | 30                                                                                | 9                                                                                 | 38   | 72                                                                                | 1038                                                                              | 30   | 18                                                                                  | 981                                                                                 | 33   |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.93 | 1.00                                                                              |                                                                                   | 0.92 | 0.99                                                                              |                                                                                   | 0.95 | 1.00                                                                                |                                                                                     | 0.95 |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Work Zone On Approach          | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                  |                                                                                     |      |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1900                                                                              | 1796 | 1900                                                                              | 1900                                                                              | 1900 | 1767                                                                              | 1811                                                                              | 1796 | 1811                                                                                | 1826                                                                                | 1900 |
| Adj Flow Rate, veh/h           | 36                                                                                | 11                                                                                | 67   | 31                                                                                | 9                                                                                 | 39   | 73                                                                                | 1059                                                                              | 31   | 18                                                                                  | 1001                                                                                | 34   |
| Peak Hour Factor               | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                                | 0.98                                                                                | 0.98 |
| Percent Heavy Veh, %           | 0                                                                                 | 0                                                                                 | 7    | 0                                                                                 | 0                                                                                 | 0    | 9                                                                                 | 6                                                                                 | 7    | 6                                                                                   | 5                                                                                   | 0    |
| Cap, veh/h                     | 180                                                                               | 22                                                                                | 132  | 150                                                                               | 24                                                                                | 104  | 447                                                                               | 2105                                                                              | 62   | 329                                                                                 | 2029                                                                                | 69   |
| Arrive On Green                | 0.10                                                                              | 0.10                                                                              | 0.10 | 0.08                                                                              | 0.08                                                                              | 0.08 | 0.04                                                                              | 0.62                                                                              | 0.62 | 0.04                                                                                | 1.00                                                                                | 1.00 |
| Sat Flow, veh/h                | 1810                                                                              | 218                                                                               | 1327 | 1810                                                                              | 289                                                                               | 1252 | 1682                                                                              | 3407                                                                              | 100  | 1725                                                                                | 3416                                                                                | 116  |
| Grp Volume(v), veh/h           | 36                                                                                | 0                                                                                 | 78   | 31                                                                                | 0                                                                                 | 48   | 73                                                                                | 535                                                                               | 555  | 18                                                                                  | 508                                                                                 | 527  |
| Grp Sat Flow(s),veh/h/ln       | 1810                                                                              | 0                                                                                 | 1544 | 1810                                                                              | 0                                                                                 | 1541 | 1682                                                                              | 1721                                                                              | 1787 | 1725                                                                                | 1735                                                                                | 1797 |
| Q Serve(g_s), s                | 1.8                                                                               | 0.0                                                                               | 4.8  | 1.6                                                                               | 0.0                                                                               | 2.9  | 1.6                                                                               | 17.2                                                                              | 17.2 | 0.4                                                                                 | 0.0                                                                                 | 0.0  |
| Cycle Q Clear(g_c), s          | 1.8                                                                               | 0.0                                                                               | 4.8  | 1.6                                                                               | 0.0                                                                               | 2.9  | 1.6                                                                               | 17.2                                                                              | 17.2 | 0.4                                                                                 | 0.0                                                                                 | 0.0  |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.86 | 1.00                                                                              |                                                                                   | 0.81 | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                                |                                                                                     | 0.06 |
| Lane Grp Cap(c), veh/h         | 180                                                                               | 0                                                                                 | 153  | 150                                                                               | 0                                                                                 | 128  | 447                                                                               | 1063                                                                              | 1104 | 329                                                                                 | 1031                                                                                | 1068 |
| V/C Ratio(X)                   | 0.20                                                                              | 0.00                                                                              | 0.51 | 0.21                                                                              | 0.00                                                                              | 0.37 | 0.16                                                                              | 0.50                                                                              | 0.50 | 0.05                                                                                | 0.49                                                                                | 0.49 |
| Avail Cap(c_a), veh/h          | 326                                                                               | 0                                                                                 | 278  | 326                                                                               | 0                                                                                 | 277  | 466                                                                               | 1063                                                                              | 1104 | 381                                                                                 | 1031                                                                                | 1068 |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 2.00                                                                                | 2.00                                                                                | 2.00 |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Uniform Delay (d), s/veh       | 41.4                                                                              | 0.0                                                                               | 42.7 | 42.8                                                                              | 0.0                                                                               | 43.4 | 6.9                                                                               | 10.6                                                                              | 10.6 | 8.5                                                                                 | 0.0                                                                                 | 0.0  |
| Incr Delay (d2), s/veh         | 0.5                                                                               | 0.0                                                                               | 2.6  | 0.7                                                                               | 0.0                                                                               | 1.8  | 0.2                                                                               | 1.7                                                                               | 1.6  | 0.1                                                                                 | 1.6                                                                                 | 1.5  |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln       | 0.8                                                                               | 0.0                                                                               | 1.9  | 0.7                                                                               | 0.0                                                                               | 1.2  | 0.6                                                                               | 6.5                                                                               | 6.7  | 0.1                                                                                 | 0.4                                                                                 | 0.4  |
| Unsig. Movement Delay, s/veh   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| LnGrp Delay(d),s/veh           | 41.9                                                                              | 0.0                                                                               | 45.3 | 43.4                                                                              | 0.0                                                                               | 45.2 | 7.0                                                                               | 12.3                                                                              | 12.2 | 8.6                                                                                 | 1.6                                                                                 | 1.5  |
| LnGrp LOS                      | D                                                                                 | A                                                                                 | D    | D                                                                                 | A                                                                                 | D    | A                                                                                 | B                                                                                 | B    | A                                                                                   | A                                                                                   | A    |
| Approach Vol, veh/h            | 114                                                                               |                                                                                   | 79   |                                                                                   |                                                                                   | 1163 |                                                                                   |                                                                                   | 1053 |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh          | 44.2                                                                              |                                                                                   | 44.5 |                                                                                   |                                                                                   | 11.9 |                                                                                   |                                                                                   | 1.6  |                                                                                     |                                                                                     |      |
| Approach LOS                   | D                                                                                 |                                                                                   | D    |                                                                                   |                                                                                   | B    |                                                                                   |                                                                                   | A    |                                                                                     |                                                                                     |      |
| Timer - Assigned Phs           | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s       | 66.3                                                                              | 14.4                                                                              |      | 8.8                                                                               | 63.9                                                                              | 12.8 |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s        | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   | 4.5                                                                               | 4.5  |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s    | 41.0                                                                              | 18.0                                                                              |      | 5.5                                                                               | 40.5                                                                              | 18.0 |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+12.4), s | 19.2                                                                              | 6.8                                                                               |      | 3.6                                                                               | 2.0                                                                               | 4.9  |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s        | 0.0                                                                               | 7.7                                                                               | 0.3  |                                                                                   | 0.0                                                                               | 8.5  | 0.2                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary           |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th Ctrl Delay             | 10.0                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th LOS                    | B                                                                                 |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 35                                                                                | 11                                                                                | 66                                                                                | 30                                                                                | 9                                                                                 | 38                                                                                | 72                                                                                  | 1038                                                                                | 30                                                                                  | 18                                                                                  | 981                                                                                 | 33                                                                                  |
| Future Volume (veh/h)         | 35                                                                                | 11                                                                                | 66                                                                                | 30                                                                                | 9                                                                                 | 38                                                                                | 72                                                                                  | 1038                                                                                | 30                                                                                  | 18                                                                                  | 981                                                                                 | 33                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                              | 0.99                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1900                                                                              | 1796                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1767                                                                                | 1811                                                                                | 1796                                                                                | 1811                                                                                | 1826                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 36                                                                                | 11                                                                                | 67                                                                                | 31                                                                                | 9                                                                                 | 39                                                                                | 73                                                                                  | 1059                                                                                | 31                                                                                  | 18                                                                                  | 1001                                                                                | 34                                                                                  |
| Peak Hour Factor              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Percent Heavy Veh, %          | 0                                                                                 | 0                                                                                 | 7                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 9                                                                                   | 6                                                                                   | 7                                                                                   | 6                                                                                   | 5                                                                                   | 0                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 180                                                                               | 22                                                                                | 132                                                                               | 150                                                                               | 24                                                                                | 104                                                                               | 447                                                                                 | 2105                                                                                | 62                                                                                  | 329                                                                                 | 2029                                                                                | 69                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Prop Arrive On Green          | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.04                                                                                | 0.62                                                                                | 0.62                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 41.9                                                                              | 0.0                                                                               | 45.3                                                                              | 43.4                                                                              | 0.0                                                                               | 45.2                                                                              | 7.0                                                                                 | 12.3                                                                                | 12.2                                                                                | 8.6                                                                                 | 1.6                                                                                 | 1.5                                                                                 |
| Ln Grp LOS                    | D                                                                                 | A                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 114                                                                               |                                                                                   |                                                                                   |                                                                                   | 79                                                                                |                                                                                   | 1163                                                                                |                                                                                     |                                                                                     |                                                                                     | 1053                                                                                |                                                                                     |
| Approach Delay, s/veh         | 44.2                                                                              |                                                                                   |                                                                                   |                                                                                   | 44.5                                                                              |                                                                                   | 11.9                                                                                |                                                                                     |                                                                                     |                                                                                     | 1.6                                                                                 |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   |                                                                                   | D                                                                                 |                                                                                   | B                                                                                   |                                                                                     |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.5                                                                               | 66.3                                                                              | 12.8                                                                              | 14.4                                                                              | 8.8                                                                               | 63.9                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.0                                                                               | 41.0                                                                              | 18.0                                                                              | 18.0                                                                              | 5.5                                                                               | 40.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.3                                                                               | 4.9                                                                               | 5.1                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.4                                                                               | 19.2                                                                              | 4.9                                                                               | 6.8                                                                               | 3.6                                                                               | 2.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 7.7                                                                               | 0.2                                                                               | 0.3                                                                               | 0.0                                                                               | 8.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.39                                                                              | 1.00                                                                              | 0.92                                                                              | 0.97                                                                              | 0.87                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.01                                                                              | 1.00                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1725                                                                              | 1810                                                                              |                                                                                   | 1810                                                                              | 1682                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 | 4                                                                                 | 6                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3407                                                                              |                                                                                   | 289                                                                               | 218                                                                               | 3416                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                | 14                                                                                | 16                                                                                |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 100                                                                               |                                                                                   | 1252                                                                              | 1327                                                                              | 116                                                                               |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

2030 Total Background AM Projected Growth + Glenwood Meadows 11:16 am 12/28/2024

Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                                     |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|
| Lanes in Grp                        | 1    | 0    | 1    | 1    | 1    | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 18   | 0    | 31   | 36   | 73   | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1725 | 0    | 1810 | 1810 | 1682 | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.4  | 0.0  | 1.6  | 1.8  | 1.6  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.4  | 0.0  | 1.6  | 1.8  | 1.6  | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 500  | 0    | 1810 | 1810 | 508  | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 59.4 | 0.0  | 0.0  | 0.0  | 59.4 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 44.6 | 0.0  | 0.0  | 0.0  | 59.4 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 329  | 0    | 150  | 180  | 447  | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.05 | 0.00 | 0.21 | 0.20 | 0.16 | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 381  | 0    | 326  | 326  | 466  | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.92 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 8.5  | 0.0  | 42.8 | 41.4 | 6.9  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1  | 0.0  | 0.7  | 0.5  | 0.2  | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 8.6  | 0.0  | 43.4 | 41.9 | 7.0  | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.1  | 0.0  | 0.7  | 0.8  | 0.5  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.1  | 0.0  | 0.7  | 0.8  | 0.6  | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.03 | 0.00 | 0.25 | 0.28 | 0.10 | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Middle Lane Group Data

|                             |      |      |      |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt               | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment             | T    |      |      |      | T    |      |      |      |
| Lanes in Grp                | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h          | 0    | 535  | 0    | 0    | 0    | 508  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln  | 0    | 1721 | 0    | 0    | 0    | 1735 | 0    | 0    |
| Q Serve Time (g_s), s       | 0.0  | 17.2 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s | 0.0  | 17.2 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h     | 0    | 1063 | 0    | 0    | 0    | 1031 | 0    | 0    |
| V/C Ratio (X)               | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h      | 0    | 1063 | 0    | 0    | 0    | 1031 | 0    | 0    |
| Upstream Filter (I)         | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh   | 0.0  | 10.6 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh      | 0.0  | 1.7  | 0.0  | 0.0  | 0.0  | 1.6  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh    | 0.0  | 12.3 | 0.0  | 0.0  | 0.0  | 1.6  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln     | 0.0  | 6.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln     | 0.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 6.5  | 0.0  | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.39 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 555  | 48   | 78   | 0    | 527  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1787 | 1541 | 1544 | 0    | 1797 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 17.2 | 2.9  | 4.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 17.2 | 2.9  | 4.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.86 | 0.00 | 0.06 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1104 | 128  | 153  | 0    | 1068 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.50 | 0.37 | 0.51 | 0.00 | 0.49 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1104 | 277  | 278  | 0    | 1068 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 10.6 | 43.4 | 42.7 | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.6  | 1.8  | 2.6  | 0.0  | 1.5  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 12.2 | 45.2 | 45.3 | 0.0  | 1.5  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 6.2  | 1.1  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.5  | 0.1  | 0.1  | 0.0  | 0.4  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 6.7  | 1.2  | 1.9  | 0.0  | 0.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.41 | 0.11 | 0.23 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 10.0 |
| HCM 6th LOS        | B    |



| Intersection             |        |       |       |        |      |      |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 1.4    |       |       |        |      |      |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR  | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |      |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 6      | 99    | 4     | 10     | 272  | 23   | 23     | 0    | 4     | 6      | 3    | 3    |
| Future Vol, veh/h        | 6      | 99    | 4     | 10     | 272  | 23   | 23     | 0    | 4     | 6      | 3    | 3    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0    | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -    | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -    | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -    | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92   | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 5     | 6     | 75     | 28   | 0    | 31     | 0    | 67    | 0      | 0    | 0    |
| Mvmt Flow                | 7      | 108   | 4     | 11     | 296  | 25   | 25     | 0    | 4     | 7      | 3    | 3    |
| Major/Minor              | Major1 |       |       | Major2 |      |      | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 321    | 0     | 0     | 112    | 0    | 0    | 458    | 467  | 110   | 457    | 457  | 309  |
| Stage 1                  | -      | -     | -     | -      | -    | -    | 124    | 124  | -     | 331    | 331  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -    | 334    | 343  | -     | 126    | 126  | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.85   | -    | -    | 7.41   | 6.5  | 6.87  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -    | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -    | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.875  | -    | -    | 3.779  | 4    | 3.903 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1250   | -     | -     | 1126   | -    | -    | 467    | 496  | 793   | 517    | 503  | 736  |
| Stage 1                  | -      | -     | -     | -      | -    | -    | 815    | 797  | -     | 687    | 649  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -    | 623    | 641  | -     | 883    | 796  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -    | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1250   | -     | -     | 1126   | -    | -    | 456    | 487  | 793   | 507    | 494  | 736  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -    | 456    | 487  | -     | 507    | 494  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -    | 810    | 792  | -     | 683    | 641  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -    | 610    | 633  | -     | 873    | 791  | -    |
| Approach                 | EB     |       |       | WB     |      |      | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.4    |       |       | 0.3    |      |      | 12.8   |      |       | 11.8   |      |      |
| HCM LOS                  |        |       |       |        |      |      | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL  | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 456    | 793   | 1250  | -      | -    | 1126 | -      | -    | 546   |        |      |      |
| HCM Lane V/C Ratio       | 0.055  | 0.005 | 0.005 | -      | -    | 0.01 | -      | -    | 0.024 |        |      |      |
| HCM Control Delay (s)    | 13.4   | 9.6   | 7.9   | 0      | -    | 8.2  | 0      | -    | 11.8  |        |      |      |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A    | A      | -    | B     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.2    | 0     | 0     | -      | -    | 0    | -      | -    | 0.1   |        |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

| Intersection             |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 1.9                                                                               |                                                                                   |                                                                                   |          |                                                                                   |       |
| Movement                 | SEL                                                                               | SET                                                                               | NWT                                                                               | NWR      | SWL                                                                               | SWR   |
| Lane Configurations      |  |  |  |          |  |       |
| Traffic Vol, veh/h       | 34                                                                                | 547                                                                               | 1061                                                                              | 31       | 30                                                                                | 54    |
| Future Vol, veh/h        | 34                                                                                | 547                                                                               | 1061                                                                              | 31       | 30                                                                                | 54    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0        | 0                                                                                 | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free     | Stop                                                                              | Stop  |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None     | -                                                                                 | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -                                                                                 | -        | 0                                                                                 | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | 0                                                                                 | -        | 1                                                                                 | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | 0                                                                                 | -        | 0                                                                                 | -     |
| Peak Hour Factor         | 90                                                                                | 90                                                                                | 90                                                                                | 90       | 90                                                                                | 90    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2        | 2                                                                                 | 2     |
| Mvmt Flow                | 38                                                                                | 608                                                                               | 1179                                                                              | 34       | 33                                                                                | 60    |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Major/Minor              | Major1                                                                            | Major2                                                                            |                                                                                   | Minor2   |                                                                                   |       |
| Conflicting Flow All     | 1213                                                                              | 0                                                                                 | -                                                                                 | 0        | 1880                                                                              | 1196  |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 1196                                                                              | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 684                                                                               | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -                                                                                 | -        | 6.42                                                                              | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -                                                                                 | -        | 5.42                                                                              | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -                                                                                 | -        | 5.42                                                                              | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -                                                                                 | -        | 3.518                                                                             | 3.318 |
| Pot Cap-1 Maneuver       | 575                                                                               | -                                                                                 | -                                                                                 | -        | 78                                                                                | 227   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 287                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 501                                                                               | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -                                                                                 | -        |                                                                                   |       |
| Mov Cap-1 Maneuver       | 575                                                                               | -                                                                                 | -                                                                                 | -        | 73                                                                                | 227   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -                                                                                 | -        | 189                                                                               | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 268                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 501                                                                               | -     |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Approach                 | SE                                                                                | NW                                                                                |                                                                                   | SW       |                                                                                   |       |
| HCM Control Delay, s     | 0.7                                                                               | 0                                                                                 |                                                                                   | 34.7     |                                                                                   |       |
| HCM LOS                  | D                                                                                 |                                                                                   |                                                                                   |          |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Minor Lane/Major Mvmt    | NWT                                                                               | NWR                                                                               | SEL                                                                               | SETSWLn1 |                                                                                   |       |
| Capacity (veh/h)         | -                                                                                 | -                                                                                 | 575                                                                               | -        | 212                                                                               |       |
| HCM Lane V/C Ratio       | -                                                                                 | -                                                                                 | 0.066                                                                             | -        | 0.44                                                                              |       |
| HCM Control Delay (s)    | -                                                                                 | -                                                                                 | 11.7                                                                              | -        | 34.7                                                                              |       |
| HCM Lane LOS             | -                                                                                 | -                                                                                 | B                                                                                 | -        | D                                                                                 |       |
| HCM 95th %tile Q(veh)    | -                                                                                 | -                                                                                 | 0.2                                                                               | -        | 2.1                                                                               |       |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 40.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 37                                                                                | 432                                                                               | 146                                                                               | 6                                                                                 | 850                                                                               | 43   | 190  | 1                                                                                 | 1    | 44   | 2                                                                                   | 59                                                                                  |
| Future Vol, veh/h        | 37                                                                                | 432                                                                               | 146                                                                               | 6                                                                                 | 850                                                                               | 43   | 190  | 1                                                                                 | 1    | 44   | 2                                                                                   | 59                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                 | 0    | 0    | 0                                                                                   | 0                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88   | 88   | 88                                                                                | 88   | 88   | 88                                                                                  | 88                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 2                                                                                 | 4                                                                                 | 0                                                                                 | 1                                                                                 | 0    | 4    | 0                                                                                 | 0    | 0    | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 42                                                                                | 491                                                                               | 166                                                                               | 7                                                                                 | 966                                                                               | 49   | 216  | 1                                                                                 | 1    | 50   | 2                                                                                   | 67                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |     | Minor2 |      |     |
|----------------------|--------|---|---|--------|---|---|--------|------|-----|--------|------|-----|
| Conflicting Flow All | 1015   | 0 | 0 | 657    | 0 | 0 | 1614   | 1604 | 491 | 1664   | 1746 | 991 |
| Stage 1              | -      | - | - | -      | - | - | 575    | 575  | -   | 1005   | 1005 | -   |
| Stage 2              | -      | - | - | -      | - | - | 1039   | 1029 | -   | 659    | 741  | -   |
| Critical Hdwy        | 4.1    | - | - | 4.1    | - | - | 7.14   | 6.5  | 6.2 | 7.1    | 6.5  | 6.2 |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.14   | 5.5  | -   | 6.1    | 5.5  | -   |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.14   | 5.5  | -   | 6.1    | 5.5  | -   |
| Follow-up Hdwy       | 2.2    | - | - | 2.2    | - | - | 3.536  | 4    | 3.3 | 3.5    | 4    | 3.3 |
| Pot Cap-1 Maneuver   | 691    | - | - | 940    | - | - | ~ 83   | 107  | 582 | 78     | 87   | 301 |
| Stage 1              | -      | - | - | -      | - | - | 500    | 506  | -   | 294    | 322  | -   |
| Stage 2              | -      | - | - | -      | - | - | 276    | 314  | -   | 456    | 426  | -   |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -    | -   | -      | -    | -   |
| Mov Cap-1 Maneuver   | 691    | - | - | 940    | - | - | ~ 61   | 100  | 582 | 73     | 81   | 301 |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | ~ 134  | 198  | -   | 183    | 197  | -   |
| Stage 1              | -      | - | - | -      | - | - | 470    | 475  | -   | 276    | 320  | -   |
| Stage 2              | -      | - | - | -      | - | - | ~ 211  | 312  | -   | 426    | 400  | -   |

| Approach             | EB  | WB  | NB       | SB   |
|----------------------|-----|-----|----------|------|
| HCM Control Delay, s | 0.6 | 0.1 | \$ 366.8 | 25.6 |
| HCM LOS              |     |     | F        | D    |

| Minor Lane/Major Mvmt | NBLn1    | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|----------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 135      | 691   | -   | -   | 940   | -   | -   | 184   | 301   |
| HCM Lane V/C Ratio    | 1.616    | 0.061 | -   | -   | 0.007 | -   | -   | 0.284 | 0.223 |
| HCM Control Delay (s) | \$ 366.8 | 10.5  | -   | -   | 8.9   | -   | -   | 32.2  | 20.4  |
| HCM Lane LOS          | F        | B     | -   | -   | A     | -   | -   | D     | C     |
| HCM 95th %tile Q(veh) | 15.6     | 0.2   | -   | -   | 0     | -   | -   | 1.1   | 0.8   |

| Notes                      |  |  |                        |  |  |                            |  |  |                                |  |  |  |
|----------------------------|--|--|------------------------|--|--|----------------------------|--|--|--------------------------------|--|--|--|
| ~: Volume exceeds capacity |  |  | \$: Delay exceeds 300s |  |  | +: Computation Not Defined |  |  | *: All major volume in platoon |  |  |  |

HCM 6th AWSC  
13: Colorado Ave & 8th Street

12/31/2024

Intersection

Intersection Delay, s/veh 16

Intersection LOS C

| Movement            | EBL  | EBT                                                                               | EBR  | WBL  | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR  |
|---------------------|------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|
| Lane Configurations |      |  |      |      |  |      |      |  |      |      |  |      |
| Traffic Vol, veh/h  | 30   | 329                                                                               | 62   | 25   | 353                                                                               | 64   | 43   | 10                                                                                | 29   | 35   | 18                                                                                  | 21   |
| Future Vol, veh/h   | 30   | 329                                                                               | 62   | 25   | 353                                                                               | 64   | 43   | 10                                                                                | 29   | 35   | 18                                                                                  | 21   |
| Peak Hour Factor    | 0.92 | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                              | 0.92 | 0.92 | 0.92                                                                                | 0.92 |
| Heavy Vehicles, %   | 0    | 1                                                                                 | 12   | 0    | 2                                                                                 | 0    | 11   | 13                                                                                | 0    | 3    | 0                                                                                   | 0    |
| Mvmt Flow           | 33   | 358                                                                               | 67   | 27   | 384                                                                               | 70   | 47   | 11                                                                                | 32   | 38   | 20                                                                                  | 23   |
| Number of Lanes     | 0    | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 0    | 1                                                                                   | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 16.5 | 17.5 | 10.7 | 10.5 |
| HCM LOS                    | C    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 52%   | 7%    | 6%    | 47%   |
| Vol Thru, %            | 12%   | 78%   | 80%   | 24%   |
| Vol Right, %           | 35%   | 15%   | 14%   | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 82    | 421   | 442   | 74    |
| LT Vol                 | 43    | 30    | 25    | 35    |
| Through Vol            | 10    | 329   | 353   | 18    |
| RT Vol                 | 29    | 62    | 64    | 21    |
| Lane Flow Rate         | 89    | 458   | 480   | 80    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.159 | 0.638 | 0.666 | 0.142 |
| Departure Headway (Hd) | 6.442 | 5.022 | 4.994 | 6.366 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 555   | 718   | 725   | 561   |
| Service Time           | 4.501 | 3.056 | 3.027 | 4.425 |
| HCM Lane V/C Ratio     | 0.16  | 0.638 | 0.662 | 0.143 |
| HCM Control Delay      | 10.7  | 16.5  | 17.5  | 10.5  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.6   | 4.6   | 5.1   | 0.5   |

Intersection

Intersection Delay, s/veh 7.9

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 13   | 63   | 16   | 18   | 46   | 41   | 0    | 0    | 0    | 52   | 38   | 17   |
| Future Vol, veh/h   | 13   | 63   | 16   | 18   | 46   | 41   | 0    | 0    | 0    | 52   | 38   | 17   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 0    | 2    | 0    | 0    | 2    | 14   | 0    | 0    | 0    | 9    | 0    | 7    |
| Mvmt Flow           | 14   | 68   | 17   | 19   | 49   | 44   | 0    | 0    | 0    | 56   | 41   | 18   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB  |
|----------------------------|-----|-----|----|-----|
| Opposing Approach          | WB  | EB  | SB | NB  |
| Opposing Lanes             | 1   | 1   | 1  | 1   |
| Conflicting Approach Left  | SB  | NB  | EB | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1   |
| Conflicting Approach Right | NB  | SB  | WB | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1   |
| HCM Control Delay          | 7.8 | 7.7 | 0  | 8.3 |
| HCM LOS                    | A   | A   | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 17%   | 49%   |
| Vol Thru, %            | 100%  | 68%   | 44%   | 36%   |
| Vol Right, %           | 0%    | 17%   | 39%   | 16%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 92    | 105   | 107   |
| LT Vol                 | 0     | 13    | 18    | 52    |
| Through Vol            | 0     | 63    | 46    | 38    |
| RT Vol                 | 0     | 16    | 41    | 17    |
| Lane Flow Rate         | 0     | 99    | 113   | 115   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.116 | 0.128 | 0.145 |
| Departure Headway (Hd) | 4.491 | 4.213 | 4.078 | 4.522 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 854   | 882   | 797   |
| Service Time           | 2.506 | 2.224 | 2.089 | 2.522 |
| HCM Lane V/C Ratio     | 0     | 0.116 | 0.128 | 0.144 |
| HCM Control Delay      | 7.5   | 7.8   | 7.7   | 8.3   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.4   | 0.5   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                     | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                               | SBT                                                                               | SBR  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|
| Lane Configurations          |  |  |      |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)       | 47                                                                                | 12                                                                                | 50   | 31                                                                                | 16                                                                                | 91    | 44                                                                                | 1809                                                                              | 15   | 24                                                                                | 902                                                                               | 24   |
| Future Volume (veh/h)        | 47                                                                                | 12                                                                                | 50   | 31                                                                                | 16                                                                                | 91    | 44                                                                                | 1809                                                                              | 15   | 24                                                                                | 902                                                                               | 24   |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.91 | 1.00                                                                              |                                                                                   | 0.93  | 1.00                                                                              |                                                                                   | 0.95 | 1.00                                                                              |                                                                                   | 0.95 |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 |
| Work Zone On Approach        | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |       | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      |
| Adj Sat Flow, veh/h/ln       | 1870                                                                              | 1900                                                                              | 1781 | 1856                                                                              | 1900                                                                              | 1900  | 1826                                                                              | 1870                                                                              | 1900 | 1900                                                                              | 1870                                                                              | 1767 |
| Adj Flow Rate, veh/h         | 48                                                                                | 12                                                                                | 51   | 32                                                                                | 16                                                                                | 93    | 45                                                                                | 1846                                                                              | 15   | 24                                                                                | 920                                                                               | 24   |
| Peak Hour Factor             | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                              | 0.98                                                                              | 0.98  | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                              | 0.98                                                                              | 0.98 |
| Percent Heavy Veh, %         | 2                                                                                 | 0                                                                                 | 8    | 3                                                                                 | 0                                                                                 | 0     | 5                                                                                 | 2                                                                                 | 0    | 0                                                                                 | 2                                                                                 | 9    |
| Cap, veh/h                   | 134                                                                               | 22                                                                                | 93   | 163                                                                               | 21                                                                                | 121   | 432                                                                               | 2551                                                                              | 21   | 178                                                                               | 2475                                                                              | 65   |
| Arrive On Green              | 0.08                                                                              | 0.08                                                                              | 0.08 | 0.09                                                                              | 0.09                                                                              | 0.09  | 0.03                                                                              | 0.71                                                                              | 0.71 | 0.02                                                                              | 0.70                                                                              | 0.70 |
| Sat Flow, veh/h              | 1781                                                                              | 291                                                                               | 1238 | 1767                                                                              | 226                                                                               | 1313  | 1739                                                                              | 3611                                                                              | 29   | 1810                                                                              | 3533                                                                              | 92   |
| Grp Volume(v), veh/h         | 48                                                                                | 0                                                                                 | 63   | 32                                                                                | 0                                                                                 | 109   | 45                                                                                | 907                                                                               | 954  | 24                                                                                | 463                                                                               | 481  |
| Grp Sat Flow(s),veh/h/ln     | 1781                                                                              | 0                                                                                 | 1530 | 1767                                                                              | 0                                                                                 | 1539  | 1739                                                                              | 1777                                                                              | 1863 | 1810                                                                              | 1777                                                                              | 1848 |
| Q Serve(g_s), s              | 4.4                                                                               | 0.0                                                                               | 6.8  | 2.8                                                                               | 0.0                                                                               | 11.8  | 1.2                                                                               | 52.0                                                                              | 52.4 | 0.6                                                                               | 17.9                                                                              | 17.9 |
| Cycle Q Clear(g_c), s        | 4.4                                                                               | 0.0                                                                               | 6.8  | 2.8                                                                               | 0.0                                                                               | 11.8  | 1.2                                                                               | 52.0                                                                              | 52.4 | 0.6                                                                               | 17.9                                                                              | 17.9 |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.81 | 1.00                                                                              |                                                                                   | 0.85  | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                              |                                                                                   | 0.05 |
| Lane Grp Cap(c), veh/h       | 134                                                                               | 0                                                                                 | 115  | 163                                                                               | 0                                                                                 | 142   | 432                                                                               | 1255                                                                              | 1316 | 178                                                                               | 1245                                                                              | 1295 |
| V/C Ratio(X)                 | 0.36                                                                              | 0.00                                                                              | 0.55 | 0.20                                                                              | 0.00                                                                              | 0.77  | 0.10                                                                              | 0.72                                                                              | 0.72 | 0.13                                                                              | 0.37                                                                              | 0.37 |
| Avail Cap(c_a), veh/h        | 194                                                                               | 0                                                                                 | 166  | 194                                                                               | 0                                                                                 | 169   | 446                                                                               | 1255                                                                              | 1316 | 204                                                                               | 1245                                                                              | 1295 |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.92                                                                              | 0.92                                                                              | 0.92 |
| Uniform Delay (d), s/veh     | 74.7                                                                              | 0.0                                                                               | 75.8 | 71.3                                                                              | 0.0                                                                               | 75.4  | 7.6                                                                               | 15.0                                                                              | 15.0 | 15.3                                                                              | 10.3                                                                              | 10.3 |
| Incr Delay (d2), s/veh       | 1.6                                                                               | 0.0                                                                               | 4.0  | 0.6                                                                               | 0.0                                                                               | 16.0  | 0.1                                                                               | 3.6                                                                               | 3.5  | 0.3                                                                               | 0.8                                                                               | 0.8  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 2.1                                                                               | 0.0                                                                               | 2.8  | 1.3                                                                               | 0.0                                                                               | 5.3   | 0.5                                                                               | 21.6                                                                              | 22.8 | 0.3                                                                               | 7.3                                                                               | 7.6  |
| Unsig. Movement Delay, s/veh |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |
| LnGrp Delay(d),s/veh         | 76.3                                                                              | 0.0                                                                               | 79.8 | 71.9                                                                              | 0.0                                                                               | 91.3  | 7.7                                                                               | 18.6                                                                              | 18.5 | 15.6                                                                              | 11.1                                                                              | 11.1 |
| LnGrp LOS                    | E                                                                                 | A                                                                                 | E    | E                                                                                 | A                                                                                 | F     | A                                                                                 | B                                                                                 | B    | B                                                                                 | B                                                                                 | B    |
| Approach Vol, veh/h          | 111                                                                               |                                                                                   | 141  |                                                                                   |                                                                                   | 1906  |                                                                                   |                                                                                   | 968  |                                                                                   |                                                                                   |      |
| Approach Delay, s/veh        | 78.3                                                                              |                                                                                   | 86.9 |                                                                                   |                                                                                   | 18.3  |                                                                                   |                                                                                   | 11.2 |                                                                                   |                                                                                   |      |
| Approach LOS                 | E                                                                                 |                                                                                   | F    |                                                                                   |                                                                                   | B     |                                                                                   |                                                                                   | B    |                                                                                   |                                                                                   |      |
| Timer - Assigned Phs         | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |      |                                                                                   |                                                                                   |      |
| Phs Duration (G+Y+Rc), s     | 7.9                                                                               | 124.6                                                                             | 17.3 |                                                                                   | 8.9                                                                               | 123.6 | 20.2                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |
| Change Period (Y+Rc), s      | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   | 4.5                                                                               | 4.5   | 4.5                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |
| Max Green Setting (Gmax), s  | 5.8                                                                               | 108.3                                                                             | 18.5 |                                                                                   | 5.7                                                                               | 109.1 | 18.7                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |
| Max Q Clear Time (g_c+12.6)  | 5.8                                                                               | 54.4                                                                              | 8.8  |                                                                                   | 3.2                                                                               | 19.9  | 13.8                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |
| Green Ext Time (p_c), s      | 0.0                                                                               | 26.1                                                                              | 0.3  |                                                                                   | 0.0                                                                               | 7.7   | 0.3                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      |
| Intersection Summary         |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |
| HCM 6th Ctrl Delay           |                                                                                   |                                                                                   | 21.3 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |
| HCM 6th LOS                  |                                                                                   |                                                                                   | C    |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 47                                                                                | 12                                                                                | 50                                                                                | 31                                                                                | 16                                                                                | 91                                                                                | 44                                                                                  | 1809                                                                                | 15                                                                                  | 24                                                                                  | 902                                                                                 | 24                                                                                  |
| Future Volume (veh/h)         | 47                                                                                | 12                                                                                | 50                                                                                | 31                                                                                | 16                                                                                | 91                                                                                | 44                                                                                  | 1809                                                                                | 15                                                                                  | 24                                                                                  | 902                                                                                 | 24                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.91                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1900                                                                              | 1781                                                                              | 1856                                                                              | 1900                                                                              | 1900                                                                              | 1826                                                                                | 1870                                                                                | 1900                                                                                | 1900                                                                                | 1870                                                                                | 1767                                                                                |
| Adj Flow Rate, veh/h          | 48                                                                                | 12                                                                                | 51                                                                                | 32                                                                                | 16                                                                                | 93                                                                                | 45                                                                                  | 1846                                                                                | 15                                                                                  | 24                                                                                  | 920                                                                                 | 24                                                                                  |
| Peak Hour Factor              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 0                                                                                 | 8                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                   | 2                                                                                   | 0                                                                                   | 0                                                                                   | 2                                                                                   | 9                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 134                                                                               | 22                                                                                | 93                                                                                | 163                                                                               | 21                                                                                | 121                                                                               | 432                                                                                 | 2551                                                                                | 21                                                                                  | 178                                                                                 | 2475                                                                                | 65                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.03                                                                                | 0.71                                                                                | 0.71                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 76.3                                                                              | 0.0                                                                               | 79.8                                                                              | 71.9                                                                              | 0.0                                                                               | 91.3                                                                              | 7.7                                                                                 | 18.6                                                                                | 18.5                                                                                | 15.6                                                                                | 11.1                                                                                | 11.1                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | E                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 111                                                                               |                                                                                   |                                                                                   | 141                                                                               |                                                                                   |                                                                                   | 1906                                                                                |                                                                                     |                                                                                     | 968                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.3                                                                              |                                                                                   |                                                                                   | 86.9                                                                              |                                                                                   |                                                                                   | 18.3                                                                                |                                                                                     |                                                                                     | 11.2                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 7.9                                                                               |                                                                                   | 124.6                                                                             | 20.2                                                                              | 17.3                                                                              | 8.9                                                                               | 123.6                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.8                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              | 18.5                                                                              | 5.7                                                                               | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.2                                                                               | 5.3                                                                               | 4.9                                                                               | 3.8                                                                               | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.6                                                                               |                                                                                   | 54.4                                                                              | 13.8                                                                              | 8.8                                                                               | 3.2                                                                               | 19.9                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 26.1                                                                              | 0.3                                                                               | 0.3                                                                               | 0.0                                                                               | 7.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.68                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.88                                                                              | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              | 0.03                                                                              | 1.00                                                                              | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1810                                                                              |                                                                                   | 1767                                                                              |                                                                                   | 1781                                                                              | 1739                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3611                                                                              |                                                                                   | 226                                                                               |                                                                                   | 291                                                                               | 3533                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 29                                                                                |                                                                                   | 1313                                                                              |                                                                                   | 1238                                                                              | 92                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

2030 Total Background PM Projected Growth + Glenwood Meadows 11:17 am 12/28/2024

Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 24    | 0    | 32   | 48   | 45    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1810  | 0    | 1767 | 1781 | 1739  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.6   | 0.0  | 2.8  | 4.4  | 1.2   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.6   | 0.0  | 2.8  | 4.4  | 1.2   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 251   | 0    | 1767 | 1781 | 580   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 119.1 | 0.0  | 0.0  | 0.0  | 119.1 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 67.7  | 0.0  | 0.0  | 0.0  | 101.2 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 5.4   | 0.0  | 0.0  | 0.0  | 1.5   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 178   | 0    | 163  | 134  | 432   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.13  | 0.00 | 0.20 | 0.36 | 0.10  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 204   | 0    | 194  | 194  | 446   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.92  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 15.3  | 0.0  | 71.3 | 74.7 | 7.6   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.3   | 0.0  | 0.6  | 1.6  | 0.1   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 15.6  | 0.0  | 71.9 | 76.3 | 7.7   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.3   | 0.0  | 1.3  | 2.0  | 0.5   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.3   | 0.0  | 1.3  | 2.1  | 0.5   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.06  | 0.00 | 0.45 | 0.70 | 0.08  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      | T    |       |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 907  | 0    | 0    | 0     | 463  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1777 | 0    | 0    | 0     | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 52.0 | 0.0  | 0.0  | 0.0   | 17.9 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 52.0 | 0.0  | 0.0  | 0.0   | 17.9 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1255 | 0    | 0    | 0     | 1245 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.72 | 0.00 | 0.00 | 0.00  | 0.37 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1255 | 0    | 0    | 0     | 1245 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 15.0 | 0.0  | 0.0  | 0.0   | 10.3 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 3.6  | 0.0  | 0.0  | 0.0   | 0.8  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 18.6 | 0.0  | 0.0  | 0.0   | 11.1 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 20.4 | 0.0  | 0.0  | 0.0   | 7.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 1.3  | 0.0  | 0.0  | 0.0   | 0.3  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 21.6 | 0.0  | 0.0  | 0.0  | 7.3  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.27 | 0.00 | 0.00 | 0.00 | 0.45 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 954  | 109  | 63   | 0    | 481  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1863 | 1539 | 1530 | 0    | 1848 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 52.4 | 11.8 | 6.8  | 0.0  | 17.9 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 52.4 | 11.8 | 6.8  | 0.0  | 17.9 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.81 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1316 | 142  | 115  | 0    | 1295 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.72 | 0.77 | 0.55 | 0.00 | 0.37 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1316 | 169  | 166  | 0    | 1295 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 15.0 | 75.4 | 75.8 | 0.0  | 10.3 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 3.5  | 16.0 | 4.0  | 0.0  | 0.8  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 18.5 | 91.3 | 79.8 | 0.0  | 11.1 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 21.5 | 4.7  | 2.7  | 0.0  | 7.3  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.3  | 0.6  | 0.1  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 22.8 | 5.3  | 2.8  | 0.0  | 7.6  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.34 | 0.48 | 0.33 | 0.00 | 0.47 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 21.3 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|-------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 1.6    |       |       |        |      |       |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 4      | 137   | 6     | 1      | 173  | 0     | 18     | 3    | 4     | 13     | 2    | 13   |
| Future Vol, veh/h        | 4      | 137   | 6     | 1      | 173  | 0     | 18     | 3    | 4     | 13     | 2    | 13   |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 33    | 6     | 0      | 12   | 0     | 12     | 0    | 0     | 0      | 0    | 0    |
| Mvmt Flow                | 4      | 149   | 7     | 1      | 188  | 0     | 20     | 3    | 4     | 14     | 2    | 14   |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 188    | 0     | 0     | 156    | 0    | 0     | 359    | 351  | 153   | 354    | 354  | 188  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 161    | 161  | -     | 190    | 190  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 198    | 190  | -     | 164    | 164  | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.1    | -    | -     | 7.22   | 6.5  | 6.2   | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.22   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.22   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.2    | -    | -     | 3.608  | 4    | 3.3   | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1398   | -     | -     | 1436   | -    | -     | 578    | 577  | 898   | 605    | 574  | 859  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 818    | 769  | -     | 816    | 747  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 781    | 747  | -     | 843    | 766  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1398   | -     | -     | 1436   | -    | -     | 565    | 575  | 898   | 598    | 572  | 859  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 565    | 575  | -     | 598    | 572  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 816    | 767  | -     | 814    | 746  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 765    | 746  | -     | 833    | 764  | -    |
| Approach                 | EB     |       |       | WB     |      |       | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.2    |       |       | 0      |      |       | 11.2   |      |       | 10.4   |      |      |
| HCM LOS                  |        |       |       |        |      |       | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 566    | 898   | 1398  | -      | -    | 1436  | -      | -    | 694   |        |      |      |
| HCM Lane V/C Ratio       | 0.04   | 0.005 | 0.003 | -      | -    | 0.001 | -      | -    | 0.044 |        |      |      |
| HCM Control Delay (s)    | 11.6   | 9     | 7.6   | 0      | -    | 7.5   | 0      | -    | 10.4  |        |      |      |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -    | B     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -    | 0.1   |        |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

| Intersection             |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 0.8                                                                               |                                                                                   |                                                                                   |        |                                                                                   |       |
| Movement                 | SEL                                                                               | SET                                                                               | NWT                                                                               | NWR    | SWL                                                                               | SWR   |
| Lane Configurations      |  |  |  |        |  |       |
| Traffic Vol, veh/h       | 59                                                                                | 1318                                                                              | 552                                                                               | 13     | 21                                                                                | 15    |
| Future Vol, veh/h        | 59                                                                                | 1318                                                                              | 552                                                                               | 13     | 21                                                                                | 15    |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                 | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free   | Stop                                                                              | Stop  |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None   | -                                                                                 | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -                                                                                 | -      | 0                                                                                 | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | 0                                                                                 | -      | 1                                                                                 | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | 0                                                                                 | -      | 0                                                                                 | -     |
| Peak Hour Factor         | 90                                                                                | 90                                                                                | 90                                                                                | 90     | 90                                                                                | 90    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                 | 2     |
| Mvmt Flow                | 66                                                                                | 1464                                                                              | 613                                                                               | 14     | 23                                                                                | 17    |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
| Major/Minor              | Major1                                                                            | Major2                                                                            |                                                                                   | Minor2 |                                                                                   |       |
| Conflicting Flow All     | 627                                                                               | 0                                                                                 | -                                                                                 | 0      | 2216                                                                              | 620   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 620                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 1596                                                                              | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -                                                                                 | -      | 6.42                                                                              | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -                                                                                 | -      | 5.42                                                                              | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -                                                                                 | -      | 5.42                                                                              | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -                                                                                 | -      | 3.518                                                                             | 3.318 |
| Pot Cap-1 Maneuver       | 955                                                                               | -                                                                                 | -                                                                                 | -      | 48                                                                                | 488   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 536                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 183                                                                               | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -                                                                                 | -      |                                                                                   |       |
| Mov Cap-1 Maneuver       | 955                                                                               | -                                                                                 | -                                                                                 | -      | 45                                                                                | 488   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -                                                                                 | -      | 138                                                                               | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 499                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 183                                                                               | -     |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
| Approach                 | SE                                                                                | NW                                                                                |                                                                                   | SW     |                                                                                   |       |
| HCM Control Delay, s     | 0.4                                                                               | 0                                                                                 |                                                                                   | 27.9   |                                                                                   |       |
| HCM LOS                  | D                                                                                 |                                                                                   |                                                                                   |        |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |       |
| Minor Lane/Major Mvmt    |                                                                                   | NWT                                                                               | NWR                                                                               | SEL    | SETSWLn1                                                                          |       |
| Capacity (veh/h)         |                                                                                   | -                                                                                 | -                                                                                 | 955    | -                                                                                 | 197   |
| HCM Lane V/C Ratio       |                                                                                   | -                                                                                 | -                                                                                 | 0.069  | -                                                                                 | 0.203 |
| HCM Control Delay (s)    |                                                                                   | -                                                                                 | -                                                                                 | 9      | -                                                                                 | 27.9  |
| HCM Lane LOS             |                                                                                   | -                                                                                 | -                                                                                 | A      | -                                                                                 | D     |
| HCM 95th %tile Q(veh)    |                                                                                   | -                                                                                 | -                                                                                 | 0.2    | -                                                                                 | 0.7   |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |          |                                                                                   |       |                                |                                                                                     |                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------|----------|-----------------------------------------------------------------------------------|-------|--------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh           | 41.3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |          |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Movement                   | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                        | NBL      | NBT                                                                               | NBR   | SBL                            | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |  |  |  |  |  |                            |          |  |       |                                |  |  |
| Traffic Vol, veh/h         | 40                                                                                | 978                                                                               | 148                                                                               | 2                                                                                 | 415                                                                               | 30                         | 205      | 0                                                                                 | 5     | 13                             | 4                                                                                   | 12                                                                                  |
| Future Vol, veh/h          | 40                                                                                | 978                                                                               | 148                                                                               | 2                                                                                 | 415                                                                               | 30                         | 205      | 0                                                                                 | 5     | 13                             | 4                                                                                   | 12                                                                                  |
| Conflicting Peds, #/hr     | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                          | 0        | 0                                                                                 | 0     | 0                              | 0                                                                                   | 0                                                                                   |
| Sign Control               | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                       | Stop     | Stop                                                                              | Stop  | Stop                           | Stop                                                                                | Stop                                                                                |
| RT Channelized             | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None                       | -        | -                                                                                 | None  | -                              | -                                                                                   | None                                                                                |
| Storage Length             | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -                          | -        | -                                                                                 | -     | -                              | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, #   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                          | -        | 1                                                                                 | -     | -                              | 1                                                                                   | -                                                                                   |
| Grade, %                   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                          | -        | 0                                                                                 | -     | -                              | 0                                                                                   | -                                                                                   |
| Peak Hour Factor           | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                         | 88       | 88                                                                                | 88    | 88                             | 88                                                                                  | 88                                                                                  |
| Heavy Vehicles, %          | 0                                                                                 | 3                                                                                 | 4                                                                                 | 0                                                                                 | 2                                                                                 | 0                          | 24       | 0                                                                                 | 0     | 60                             | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                  | 45                                                                                | 1111                                                                              | 168                                                                               | 2                                                                                 | 472                                                                               | 34                         | 233      | 0                                                                                 | 6     | 15                             | 5                                                                                   | 14                                                                                  |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |          |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Major/Minor                | Major1                                                                            |                                                                                   |                                                                                   | Major2                                                                            |                                                                                   |                            | Minor1   |                                                                                   |       | Minor2                         |                                                                                     |                                                                                     |
| Conflicting Flow All       | 506                                                                               | 0                                                                                 | 0                                                                                 | 1279                                                                              | 0                                                                                 | 0                          | 1704     | 1711                                                                              | 1111  | 1781                           | 1862                                                                                | 489                                                                                 |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 1201     | 1201                                                                              | -     | 493                            | 493                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 503      | 510                                                                               | -     | 1288                           | 1369                                                                                | -                                                                                   |
| Critical Hdwy              | 4.1                                                                               | -                                                                                 | -                                                                                 | 4.1                                                                               | -                                                                                 | -                          | 7.34     | 6.5                                                                               | 6.2   | 7.7                            | 6.5                                                                                 | 6.2                                                                                 |
| Critical Hdwy Stg 1        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 6.34     | 5.5                                                                               | -     | 6.7                            | 5.5                                                                                 | -                                                                                   |
| Critical Hdwy Stg 2        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 6.34     | 5.5                                                                               | -     | 6.7                            | 5.5                                                                                 | -                                                                                   |
| Follow-up Hdwy             | 2.2                                                                               | -                                                                                 | -                                                                                 | 2.2                                                                               | -                                                                                 | -                          | 3.716    | 4                                                                                 | 3.3   | 4.04                           | 4                                                                                   | 3.3                                                                                 |
| Pot Cap-1 Maneuver         | 1069                                                                              | -                                                                                 | -                                                                                 | 550                                                                               | -                                                                                 | -                          | ~ 64     | 92                                                                                | 257   | 46                             | 74                                                                                  | 583                                                                                 |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | ~ 204    | 260                                                                               | -     | 464                            | 550                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 512      | 541                                                                               | -     | 153                            | 216                                                                                 | -                                                                                   |
| Platoon blocked, %         |                                                                                   | -                                                                                 | -                                                                                 |                                                                                   | -                                                                                 | -                          |          |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Mov Cap-1 Maneuver         | 1069                                                                              | -                                                                                 | -                                                                                 | 550                                                                               | -                                                                                 | -                          | ~ 59     | 88                                                                                | 257   | 43                             | 71                                                                                  | 583                                                                                 |
| Mov Cap-2 Maneuver         | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | ~ 146    | 186                                                                               | -     | 111                            | 160                                                                                 | -                                                                                   |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | ~ 195    | 249                                                                               | -     | 445                            | 548                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                          | 494      | 539                                                                               | -     | 143                            | 207                                                                                 | -                                                                                   |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |          |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Approach                   | EB                                                                                |                                                                                   |                                                                                   | WB                                                                                |                                                                                   |                            | NB       |                                                                                   |       | SB                             |                                                                                     |                                                                                     |
| HCM Control Delay, s       | 0.3                                                                               |                                                                                   |                                                                                   | 0.1                                                                               |                                                                                   |                            | \$ 358.5 |                                                                                   |       | 28.5                           |                                                                                     |                                                                                     |
| HCM LOS                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            | F        |                                                                                   |       | D                              |                                                                                     |                                                                                     |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |          |                                                                                   |       |                                |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt      | NBLn1                                                                             | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                        | WBR      | SBLn1                                                                             | SBLn2 |                                |                                                                                     |                                                                                     |
| Capacity (veh/h)           | 148                                                                               | 1069                                                                              | -                                                                                 | -                                                                                 | 550                                                                               | -                          | -        | 120                                                                               | 583   |                                |                                                                                     |                                                                                     |
| HCM Lane V/C Ratio         | 1.612                                                                             | 0.043                                                                             | -                                                                                 | -                                                                                 | 0.004                                                                             | -                          | -        | 0.161                                                                             | 0.023 |                                |                                                                                     |                                                                                     |
| HCM Control Delay (s)      | \$ 358.5                                                                          | 8.5                                                                               | -                                                                                 | -                                                                                 | 11.6                                                                              | -                          | -        | 40.7                                                                              | 11.3  |                                |                                                                                     |                                                                                     |
| HCM Lane LOS               | F                                                                                 | A                                                                                 | -                                                                                 | -                                                                                 | B                                                                                 | -                          | -        | E                                                                                 | B     |                                |                                                                                     |                                                                                     |
| HCM 95th %tile Q(veh)      | 16.7                                                                              | 0.1                                                                               | -                                                                                 | -                                                                                 | 0                                                                                 | -                          | -        | 0.6                                                                               | 0.1   |                                |                                                                                     |                                                                                     |
| Notes                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                            |          |                                                                                   |       |                                |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity |                                                                                   | \$: Delay exceeds 300s                                                            |                                                                                   |                                                                                   |                                                                                   | +: Computation Not Defined |          |                                                                                   |       | *: All major volume in platoon |                                                                                     |                                                                                     |

Intersection

Intersection Delay, s/veh 18.7

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 14   | 392  | 58   | 128  | 261  | 77   | 44   | 18   | 19   | 21   | 26   | 23   |
| Future Vol, veh/h   | 14   | 392  | 58   | 128  | 261  | 77   | 44   | 18   | 19   | 21   | 26   | 23   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 0    | 2    | 12   | 2    | 4    | 0    | 11   | 0    | 0    | 0    | 0    | 0    |
| Mvmt Flow           | 15   | 426  | 63   | 139  | 284  | 84   | 48   | 20   | 21   | 23   | 28   | 25   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 19.7 | 20.3 | 11.1 | 10.6 |
| HCM LOS                    | C    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 54%   | 3%    | 27%   | 30%   |
| Vol Thru, %            | 22%   | 84%   | 56%   | 37%   |
| Vol Right, %           | 23%   | 12%   | 17%   | 33%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 81    | 464   | 466   | 70    |
| LT Vol                 | 44    | 14    | 128   | 21    |
| Through Vol            | 18    | 392   | 261   | 26    |
| RT Vol                 | 19    | 58    | 77    | 23    |
| Lane Flow Rate         | 88    | 504   | 507   | 76    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.164 | 0.711 | 0.721 | 0.137 |
| Departure Headway (Hd) | 6.707 | 5.074 | 5.123 | 6.459 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 533   | 711   | 704   | 552   |
| Service Time           | 4.779 | 3.115 | 3.165 | 4.532 |
| HCM Lane V/C Ratio     | 0.165 | 0.709 | 0.72  | 0.138 |
| HCM Control Delay      | 11.1  | 19.7  | 20.3  | 10.6  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.6   | 6     | 6.2   | 0.5   |

Intersection

Intersection Delay, s/veh 9.3

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 28   | 34   | 17   | 12   | 37   | 71   | 3    | 0    | 0    | 74   | 151  | 37   |
| Future Vol, veh/h   | 28   | 34   | 17   | 12   | 37   | 71   | 3    | 0    | 0    | 74   | 151  | 37   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 0    | 12   | 0    | 0    | 4    | 11   | 0    | 0    | 0    | 11   | 1    | 4    |
| Mvmt Flow           | 30   | 37   | 18   | 13   | 40   | 76   | 3    | 0    | 0    | 80   | 162  | 40   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB   |
|----------------------------|-----|-----|----|------|
| Opposing Approach          | WB  | EB  | SB | NB   |
| Opposing Lanes             | 1   | 1   | 1  | 1    |
| Conflicting Approach Left  | SB  | NB  | EB | WB   |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1    |
| Conflicting Approach Right | NB  | SB  | WB | EB   |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1    |
| HCM Control Delay          | 8.3 | 8.2 | 8  | 10.1 |
| HCM LOS                    | A   | A   | A  | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 10%   | 28%   |
| Vol Thru, %            | 0%    | 43%   | 31%   | 58%   |
| Vol Right, %           | 0%    | 22%   | 59%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 3     | 79    | 120   | 262   |
| LT Vol                 | 3     | 28    | 12    | 74    |
| Through Vol            | 0     | 34    | 37    | 151   |
| RT Vol                 | 0     | 17    | 71    | 37    |
| Lane Flow Rate         | 3     | 85    | 129   | 282   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.004 | 0.11  | 0.156 | 0.356 |
| Departure Headway (Hd) | 4.919 | 4.674 | 4.353 | 4.548 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 727   | 767   | 825   | 792   |
| Service Time           | 2.955 | 2.701 | 2.376 | 2.573 |
| HCM Lane V/C Ratio     | 0.004 | 0.111 | 0.156 | 0.356 |
| HCM Control Delay      | 8     | 8.3   | 8.2   | 10.1  |
| HCM Lane LOS           | A     | A     | A     | B     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.6   | 1.6   |



# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                       | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations            |  |  |      |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)         | 38                                                                                | 12                                                                                | 71   | 33                                                                                | 10                                                                                | 41    | 78                                                                                | 1116                                                                              | 33   | 19                                                                                  | 1052                                                                                | 35   |
| Future Volume (veh/h)          | 38                                                                                | 12                                                                                | 71   | 33                                                                                | 10                                                                                | 41    | 78                                                                                | 1116                                                                              | 33   | 19                                                                                  | 1052                                                                                | 35   |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.92 | 1.00                                                                              |                                                                                   | 0.90  | 1.00                                                                              |                                                                                   | 0.95 | 1.00                                                                                |                                                                                     | 0.95 |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Work Zone On Approach          | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |       | No                                                                                |                                                                                   |      | No                                                                                  |                                                                                     |      |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1900                                                                              | 1796 | 1900                                                                              | 1900                                                                              | 1900  | 1767                                                                              | 1811                                                                              | 1796 | 1811                                                                                | 1826                                                                                | 1900 |
| Adj Flow Rate, veh/h           | 39                                                                                | 12                                                                                | 72   | 34                                                                                | 10                                                                                | 42    | 80                                                                                | 1139                                                                              | 34   | 19                                                                                  | 1073                                                                                | 36   |
| Peak Hour Factor               | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                              | 0.98                                                                              | 0.98  | 0.98                                                                              | 0.98                                                                              | 0.98 | 0.98                                                                                | 0.98                                                                                | 0.98 |
| Percent Heavy Veh, %           | 0                                                                                 | 0                                                                                 | 7    | 0                                                                                 | 0                                                                                 | 0     | 9                                                                                 | 6                                                                                 | 7    | 6                                                                                   | 5                                                                                   | 0    |
| Cap, veh/h                     | 151                                                                               | 18                                                                                | 109  | 129                                                                               | 21                                                                                | 87    | 368                                                                               | 2459                                                                              | 73   | 342                                                                                 | 2429                                                                                | 81   |
| Arrive On Green                | 0.08                                                                              | 0.08                                                                              | 0.08 | 0.07                                                                              | 0.07                                                                              | 0.07  | 0.03                                                                              | 0.72                                                                              | 0.72 | 0.02                                                                                | 0.71                                                                                | 0.71 |
| Sat Flow, veh/h                | 1810                                                                              | 218                                                                               | 1308 | 1810                                                                              | 293                                                                               | 1230  | 1682                                                                              | 3406                                                                              | 102  | 1725                                                                                | 3419                                                                                | 115  |
| Grp Volume(v), veh/h           | 39                                                                                | 0                                                                                 | 84   | 34                                                                                | 0                                                                                 | 52    | 80                                                                                | 575                                                                               | 598  | 19                                                                                  | 544                                                                                 | 565  |
| Grp Sat Flow(s),veh/h/ln       | 1810                                                                              | 0                                                                                 | 1526 | 1810                                                                              | 0                                                                                 | 1523  | 1682                                                                              | 1721                                                                              | 1787 | 1725                                                                                | 1735                                                                                | 1799 |
| Q Serve(g_s), s                | 3.4                                                                               | 0.0                                                                               | 9.1  | 3.0                                                                               | 0.0                                                                               | 5.6   | 2.2                                                                               | 23.7                                                                              | 23.8 | 0.5                                                                                 | 22.5                                                                                | 22.5 |
| Cycle Q Clear(g_c), s          | 3.4                                                                               | 0.0                                                                               | 9.1  | 3.0                                                                               | 0.0                                                                               | 5.6   | 2.2                                                                               | 23.7                                                                              | 23.8 | 0.5                                                                                 | 22.5                                                                                | 22.5 |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.86 | 1.00                                                                              |                                                                                   | 0.81  | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                                |                                                                                     | 0.06 |
| Lane Grp Cap(c), veh/h         | 151                                                                               | 0                                                                                 | 128  | 129                                                                               | 0                                                                                 | 108   | 368                                                                               | 1242                                                                              | 1290 | 342                                                                                 | 1233                                                                                | 1278 |
| V/C Ratio(X)                   | 0.26                                                                              | 0.00                                                                              | 0.66 | 0.26                                                                              | 0.00                                                                              | 0.48  | 0.22                                                                              | 0.46                                                                              | 0.46 | 0.06                                                                                | 0.44                                                                                | 0.44 |
| Avail Cap(c_a), veh/h          | 250                                                                               | 0                                                                                 | 211  | 229                                                                               | 0                                                                                 | 193   | 463                                                                               | 1242                                                                              | 1290 | 378                                                                                 | 1233                                                                                | 1278 |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.92                                                                                | 0.92                                                                                | 0.92 |
| Uniform Delay (d), s/veh       | 72.9                                                                              | 0.0                                                                               | 75.5 | 74.8                                                                              | 0.0                                                                               | 75.9  | 7.8                                                                               | 9.9                                                                               | 9.9  | 7.8                                                                                 | 10.4                                                                                | 10.4 |
| Incr Delay (d2), s/veh         | 0.9                                                                               | 0.0                                                                               | 5.6  | 1.1                                                                               | 0.0                                                                               | 3.3   | 0.3                                                                               | 1.2                                                                               | 1.2  | 0.1                                                                                 | 1.1                                                                                 | 1.0  |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln       | 1.6                                                                               | 0.0                                                                               | 3.8  | 1.5                                                                               | 0.0                                                                               | 2.3   | 0.8                                                                               | 9.3                                                                               | 9.6  | 0.2                                                                                 | 8.9                                                                                 | 9.2  |
| Unsig. Movement Delay, s/veh   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| LnGrp Delay(d),s/veh           | 73.8                                                                              | 0.0                                                                               | 81.2 | 75.8                                                                              | 0.0                                                                               | 79.2  | 8.1                                                                               | 11.1                                                                              | 11.1 | 7.9                                                                                 | 11.4                                                                                | 11.4 |
| LnGrp LOS                      | E                                                                                 | A                                                                                 | F    | E                                                                                 | A                                                                                 | E     | A                                                                                 | B                                                                                 | B    | A                                                                                   | B                                                                                   | B    |
| Approach Vol, veh/h            | 123                                                                               |                                                                                   | 86   |                                                                                   |                                                                                   | 1253  |                                                                                   |                                                                                   | 1128 |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh          | 78.8                                                                              |                                                                                   | 77.9 |                                                                                   |                                                                                   | 10.9  |                                                                                   |                                                                                   | 11.4 |                                                                                     |                                                                                     |      |
| Approach LOS                   | E                                                                                 |                                                                                   | E    |                                                                                   |                                                                                   | B     |                                                                                   |                                                                                   | B    |                                                                                     |                                                                                     |      |
| Timer - Assigned Phs           | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s       | 7.5                                                                               | 127.2                                                                             | 18.7 |                                                                                   | 9.4                                                                               | 125.3 | 16.6                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s        | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   | 4.5                                                                               | 4.5   | 4.5                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s    | 6.5                                                                               | 100.5                                                                             | 23.5 |                                                                                   | 14.5                                                                              | 92.5  | 21.5                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+12.5), s | 12.5                                                                              | 25.8                                                                              | 11.1 |                                                                                   | 4.2                                                                               | 24.5  | 7.6                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s        | 0.0                                                                               | 11.1                                                                              | 0.4  |                                                                                   | 0.1                                                                               | 10.0  | 0.2                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary           |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th Ctrl Delay             |                                                                                   |                                                                                   | 16.6 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th LOS                    |                                                                                   |                                                                                   | B    |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 38                                                                                | 12                                                                                | 71                                                                                | 33                                                                                | 10                                                                                | 41                                                                                | 78                                                                                  | 1116                                                                                | 33                                                                                  | 19                                                                                  | 1052                                                                                | 35                                                                                  |
| Future Volume (veh/h)         | 38                                                                                | 12                                                                                | 71                                                                                | 33                                                                                | 10                                                                                | 41                                                                                | 78                                                                                  | 1116                                                                                | 33                                                                                  | 19                                                                                  | 1052                                                                                | 35                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.92                                                                              | 1.00                                                                              |                                                                                   | 0.90                                                                              | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1900                                                                              | 1796                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1767                                                                                | 1811                                                                                | 1796                                                                                | 1811                                                                                | 1826                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 39                                                                                | 12                                                                                | 72                                                                                | 34                                                                                | 10                                                                                | 42                                                                                | 80                                                                                  | 1139                                                                                | 34                                                                                  | 19                                                                                  | 1073                                                                                | 36                                                                                  |
| Peak Hour Factor              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Percent Heavy Veh, %          | 0                                                                                 | 0                                                                                 | 7                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 9                                                                                   | 6                                                                                   | 7                                                                                   | 6                                                                                   | 5                                                                                   | 0                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 151                                                                               | 18                                                                                | 109                                                                               | 129                                                                               | 21                                                                                | 87                                                                                | 368                                                                                 | 2459                                                                                | 73                                                                                  | 342                                                                                 | 2429                                                                                | 81                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.07                                                                              | 0.07                                                                              | 0.07                                                                              | 0.03                                                                                | 0.72                                                                                | 0.72                                                                                | 0.02                                                                                | 0.71                                                                                | 0.71                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 73.8                                                                              | 0.0                                                                               | 81.2                                                                              | 75.8                                                                              | 0.0                                                                               | 79.2                                                                              | 8.1                                                                                 | 11.1                                                                                | 11.1                                                                                | 7.9                                                                                 | 11.4                                                                                | 11.4                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | E                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 123                                                                               |                                                                                   |                                                                                   | 86                                                                                |                                                                                   |                                                                                   | 1253                                                                                |                                                                                     |                                                                                     | 1128                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.8                                                                              |                                                                                   |                                                                                   | 77.9                                                                              |                                                                                   |                                                                                   | 10.9                                                                                |                                                                                     |                                                                                     | 11.4                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 7.5                                                                               | 127.2                                                                             | 16.6                                                                              | 18.7                                                                              | 9.4                                                                               | 125.3                                                                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               | 100.5                                                                             | 21.5                                                                              | 23.5                                                                              | 14.5                                                                              | 92.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.3                                                                               | 5.0                                                                               | 5.1                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.5                                                                               | 25.8                                                                              | 7.6                                                                               | 11.1                                                                              | 4.2                                                                               | 24.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 11.1                                                                              | 0.2                                                                               | 0.4                                                                               | 0.1                                                                               | 10.0                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.59                                                                              | 1.00                                                                              | 0.99                                                                              | 1.00                                                                              | 0.98                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 0.75                                                                              | 0.00                                                                              | 0.00                                                                              | 0.01                                                                              | 0.00                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1725                                                                              |                                                                                   | 1810                                                                              | 1810                                                                              | 1682                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 3406                                                                              | 293                                                                               | 218                                                                               |                                                                                   | 3419                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 12                                                                                | 18                                                                                | 14                                                                                |                                                                                   | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 102                                                                               | 1230                                                                              | 1308                                                                              |                                                                                   | 115                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

2045 Total Background AM Projected Growth + Glenwood Meadows 11:17 am 12/28/2024

Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 19    | 0    | 34   | 39   | 80    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1725  | 0    | 1810 | 1810 | 1682  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.5   | 0.0  | 3.0  | 3.4  | 2.2   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.5   | 0.0  | 3.0  | 3.4  | 2.2   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 463   | 0    | 1810 | 1810 | 480   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 120.8 | 0.0  | 0.0  | 0.0  | 120.8 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 99.0  | 0.0  | 0.0  | 0.0  | 98.3  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.9   | 0.0  | 0.0  | 0.0  | 4.5   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 342   | 0    | 129  | 151  | 368   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.06  | 0.00 | 0.26 | 0.26 | 0.22  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 378   | 0    | 229  | 250  | 463   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.92  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 7.8   | 0.0  | 74.8 | 72.9 | 7.8   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1   | 0.0  | 1.1  | 0.9  | 0.3   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 7.9   | 0.0  | 75.8 | 73.8 | 8.1   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.2   | 0.0  | 1.4  | 1.6  | 0.8   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.2   | 0.0  | 1.5  | 1.6  | 0.8   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.04  | 0.00 | 0.49 | 0.55 | 0.15  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      | T    |       |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 575  | 0    | 0    | 0     | 544  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1721 | 0    | 0    | 0     | 1735 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 23.7 | 0.0  | 0.0  | 0.0   | 22.5 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 23.7 | 0.0  | 0.0  | 0.0   | 22.5 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1242 | 0    | 0    | 0     | 1233 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.46 | 0.00 | 0.00 | 0.00  | 0.44 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1242 | 0    | 0    | 0     | 1233 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 9.9  | 0.0  | 0.0  | 0.0   | 10.4 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 1.2  | 0.0  | 0.0  | 0.0   | 1.1  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 11.1 | 0.0  | 0.0  | 0.0   | 11.4 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 8.9  | 0.0  | 0.0  | 0.0   | 8.5  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.4  | 0.0  | 0.0  | 0.0   | 0.4  | 0.0  | 0.0  |

2045 Total Background AM Projected Growth + Glenwood Meadows 11:17 am 12/28/2024

Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 9.3  | 0.0  | 0.0  | 0.0  | 8.9  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.56 | 0.00 | 0.00 | 0.00 | 0.56 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 598  | 52   | 84   | 0    | 565  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1787 | 1523 | 1526 | 0    | 1799 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 23.8 | 5.6  | 9.1  | 0.0  | 22.5 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 23.8 | 5.6  | 9.1  | 0.0  | 22.5 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.86 | 0.00 | 0.06 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1290 | 108  | 128  | 0    | 1278 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.46 | 0.48 | 0.66 | 0.00 | 0.44 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1290 | 193  | 211  | 0    | 1278 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 9.9  | 75.9 | 75.5 | 0.0  | 10.4 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.2  | 3.3  | 5.6  | 0.0  | 1.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 11.1 | 79.2 | 81.2 | 0.0  | 11.4 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 9.2  | 2.2  | 3.6  | 0.0  | 8.9  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.4  | 0.1  | 0.2  | 0.0  | 0.4  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 9.6  | 2.3  | 3.8  | 0.0  | 9.2  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.58 | 0.21 | 0.45 | 0.00 | 0.58 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 16.6 |
| HCM 6th LOS        | B    |

| Intersection             |        |       |       |        |      |      |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 1.4    |       |       |        |      |      |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR  | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |      |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 6      | 99    | 4     | 10     | 272  | 23   | 23     | 0    | 4     | 6      | 3    | 3    |
| Future Vol, veh/h        | 6      | 99    | 4     | 10     | 272  | 23   | 23     | 0    | 4     | 6      | 3    | 3    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0    | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -    | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -    | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -    | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92   | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 5     | 6     | 75     | 28   | 0    | 31     | 0    | 67    | 0      | 0    | 0    |
| Mvmt Flow                | 7      | 108   | 4     | 11     | 296  | 25   | 25     | 0    | 4     | 7      | 3    | 3    |
| Major/Minor              | Major1 |       |       | Major2 |      |      | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 321    | 0     | 0     | 112    | 0    | 0    | 458    | 467  | 110   | 457    | 457  | 309  |
| Stage 1                  | -      | -     | -     | -      | -    | -    | 124    | 124  | -     | 331    | 331  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -    | 334    | 343  | -     | 126    | 126  | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.85   | -    | -    | 7.41   | 6.5  | 6.87  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -    | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -    | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.875  | -    | -    | 3.779  | 4    | 3.903 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1250   | -     | -     | 1126   | -    | -    | 467    | 496  | 793   | 517    | 503  | 736  |
| Stage 1                  | -      | -     | -     | -      | -    | -    | 815    | 797  | -     | 687    | 649  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -    | 623    | 641  | -     | 883    | 796  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -    | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1250   | -     | -     | 1126   | -    | -    | 456    | 487  | 793   | 507    | 494  | 736  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -    | 456    | 487  | -     | 507    | 494  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -    | 810    | 792  | -     | 683    | 641  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -    | 610    | 633  | -     | 873    | 791  | -    |
| Approach                 | EB     |       |       | WB     |      |      | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.4    |       |       | 0.3    |      |      | 12.8   |      |       | 11.8   |      |      |
| HCM LOS                  |        |       |       |        |      |      | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL  | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 456    | 793   | 1250  | -      | -    | 1126 | -      | -    | 546   |        |      |      |
| HCM Lane V/C Ratio       | 0.055  | 0.005 | 0.005 | -      | -    | 0.01 | -      | -    | 0.024 |        |      |      |
| HCM Control Delay (s)    | 13.4   | 9.6   | 7.9   | 0      | -    | 8.2  | 0      | -    | 11.8  |        |      |      |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A    | A      | -    | B     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.2    | 0     | 0     | -      | -    | 0    | -      | -    | 0.1   |        |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

| Intersection             |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |                                                                                   |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Int Delay, s/veh         | 2.1                                                                               |                                                                                   |                                                                                   |        |                                                                                   |                                                                                   |
| Movement                 | SEL                                                                               | SET                                                                               | NWT                                                                               | NWR    | SWL                                                                               | SWR                                                                               |
| Lane Configurations      |  |  |  |        |  |  |
| Traffic Vol, veh/h       | 34                                                                                | 591                                                                               | 1154                                                                              | 31     | 30                                                                                | 54                                                                                |
| Future Vol, veh/h        | 34                                                                                | 591                                                                               | 1154                                                                              | 31     | 30                                                                                | 54                                                                                |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0      | 0                                                                                 | 0                                                                                 |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free   | Stop                                                                              | Stop                                                                              |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None   | -                                                                                 | None                                                                              |
| Storage Length           | 100                                                                               | -                                                                                 | -                                                                                 | -      | 0                                                                                 | -                                                                                 |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | 0                                                                                 | -      | 1                                                                                 | -                                                                                 |
| Grade, %                 | -                                                                                 | 0                                                                                 | 0                                                                                 | -      | 0                                                                                 | -                                                                                 |
| Peak Hour Factor         | 90                                                                                | 90                                                                                | 90                                                                                | 90     | 90                                                                                | 90                                                                                |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2      | 2                                                                                 | 2                                                                                 |
| Mvmt Flow                | 38                                                                                | 657                                                                               | 1282                                                                              | 34     | 33                                                                                | 60                                                                                |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |                                                                                   |
| Major/Minor              | Major1                                                                            | Major2                                                                            |                                                                                   | Minor2 |                                                                                   |                                                                                   |
| Conflicting Flow All     | 1316                                                                              | 0                                                                                 | -                                                                                 | 0      | 2032                                                                              | 1299                                                                              |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 1299                                                                              | -                                                                                 |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 733                                                                               | -                                                                                 |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -                                                                                 | -      | 6.42                                                                              | 6.22                                                                              |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -                                                                                 | -      | 5.42                                                                              | -                                                                                 |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -                                                                                 | -      | 5.42                                                                              | -                                                                                 |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -                                                                                 | -      | 3.518                                                                             | 3.318                                                                             |
| Pot Cap-1 Maneuver       | 525                                                                               | -                                                                                 | -                                                                                 | -      | 63                                                                                | 197                                                                               |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 256                                                                               | -                                                                                 |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 475                                                                               | -                                                                                 |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -                                                                                 | -      |                                                                                   |                                                                                   |
| Mov Cap-1 Maneuver       | 525                                                                               | -                                                                                 | -                                                                                 | -      | 58                                                                                | 197                                                                               |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -                                                                                 | -      | 168                                                                               | -                                                                                 |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 238                                                                               | -                                                                                 |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -      | 475                                                                               | -                                                                                 |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |                                                                                   |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |                                                                                   |
| Approach                 | SE                                                                                | NW                                                                                |                                                                                   | SW     |                                                                                   |                                                                                   |
| HCM Control Delay, s     | 0.7                                                                               | 0                                                                                 |                                                                                   | 42.4   |                                                                                   |                                                                                   |
| HCM LOS                  | E                                                                                 |                                                                                   |                                                                                   |        |                                                                                   |                                                                                   |
|                          |                                                                                   |                                                                                   |                                                                                   |        |                                                                                   |                                                                                   |
| Minor Lane/Major Mvmt    |                                                                                   | NWT                                                                               | NWR                                                                               | SEL    | SETSWLn1                                                                          |                                                                                   |
| Capacity (veh/h)         |                                                                                   | -                                                                                 | -                                                                                 | 525    | -                                                                                 | 186                                                                               |
| HCM Lane V/C Ratio       |                                                                                   | -                                                                                 | -                                                                                 | 0.072  | -                                                                                 | 0.502                                                                             |
| HCM Control Delay (s)    |                                                                                   | -                                                                                 | -                                                                                 | 12.4   | -                                                                                 | 42.4                                                                              |
| HCM Lane LOS             |                                                                                   | -                                                                                 | -                                                                                 | B      | -                                                                                 | E                                                                                 |
| HCM 95th %tile Q(veh)    |                                                                                   | -                                                                                 | -                                                                                 | 0.2    | -                                                                                 | 2.5                                                                               |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 61.9                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 37                                                                                | 463                                                                               | 146                                                                               | 6                                                                                 | 914                                                                               | 43   | 190  | 1                                                                                 | 1    | 44   | 2                                                                                   | 59                                                                                  |
| Future Vol, veh/h        | 37                                                                                | 463                                                                               | 146                                                                               | 6                                                                                 | 914                                                                               | 43   | 190  | 1                                                                                 | 1    | 44   | 2                                                                                   | 59                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                 | 0    | 0    | 0                                                                                   | 0                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88   | 88   | 88                                                                                | 88   | 88   | 88                                                                                  | 88                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 3                                                                                 | 4                                                                                 | 0                                                                                 | 2                                                                                 | 0    | 24   | 0                                                                                 | 0    | 60   | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 42                                                                                | 526                                                                               | 166                                                                               | 7                                                                                 | 1039                                                                              | 49   | 216  | 1                                                                                 | 1    | 50   | 2                                                                                   | 67                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |     | Minor2 |      |      |
|----------------------|--------|---|---|--------|---|---|--------|------|-----|--------|------|------|
| Conflicting Flow All | 1088   | 0 | 0 | 692    | 0 | 0 | 1722   | 1712 | 526 | 1772   | 1854 | 1064 |
| Stage 1              | -      | - | - | -      | - | - | 610    | 610  | -   | 1078   | 1078 | -    |
| Stage 2              | -      | - | - | -      | - | - | 1112   | 1102 | -   | 694    | 776  | -    |
| Critical Hdwy        | 4.1    | - | - | 4.1    | - | - | 7.34   | 6.5  | 6.2 | 7.7    | 6.5  | 6.2  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.34   | 5.5  | -   | 6.7    | 5.5  | -    |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.34   | 5.5  | -   | 6.7    | 5.5  | -    |
| Follow-up Hdwy       | 2.2    | - | - | 2.2    | - | - | 3.716  | 4    | 3.3 | 4.04   | 4    | 3.3  |
| Pot Cap-1 Maneuver   | 649    | - | - | 912    | - | - | ~ 62   | 91   | 556 | ~ 46   | 75   | 273  |
| Stage 1              | -      | - | - | -      | - | - | 446    | 488  | -   | 207    | 297  | -    |
| Stage 2              | -      | - | - | -      | - | - | 230    | 290  | -   | 353    | 410  | -    |
| Platoon blocked, %   |        | - | - |        | - | - |        |      |     |        |      |      |
| Mov Cap-1 Maneuver   | 649    | - | - | 912    | - | - | ~ 44   | 84   | 556 | ~ 43   | 70   | 273  |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | ~ 103  | 180  | -   | 129    | 182  | -    |
| Stage 1              | -      | - | - | -      | - | - | 417    | 456  | -   | 194    | 295  | -    |
| Stage 2              | -      | - | - | -      | - | - | ~ 171  | 288  | -   | 329    | 383  | -    |

| Approach             | EB  |  |  | WB  |  |  | NB       |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|----------|--|--|------|--|--|
| HCM Control Delay, s | 0.6 |  |  | 0.1 |  |  | \$ 592.8 |  |  | 34.3 |  |  |
| HCM LOS              |     |  |  |     |  |  | F        |  |  | D    |  |  |

| Minor Lane/Major Mvmt | NBLn1    | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|----------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 104      | 649   | -   | -   | 912   | -   | -   | 131   | 273   |
| HCM Lane V/C Ratio    | 2.098    | 0.065 | -   | -   | 0.007 | -   | -   | 0.399 | 0.246 |
| HCM Control Delay (s) | \$ 592.8 | 10.9  | -   | -   | 9     | -   | -   | 49.6  | 22.4  |
| HCM Lane LOS          | F        | B     | -   | -   | A     | -   | -   | E     | C     |
| HCM 95th %tile Q(veh) | 18.7     | 0.2   | -   | -   | 0     | -   | -   | 1.7   | 0.9   |

| Notes                      |  |  |                        |  |  |                            |  |  |                                |  |  |  |
|----------------------------|--|--|------------------------|--|--|----------------------------|--|--|--------------------------------|--|--|--|
| ~: Volume exceeds capacity |  |  | \$: Delay exceeds 300s |  |  | +: Computation Not Defined |  |  | *: All major volume in platoon |  |  |  |



HCM 6th AWSC  
13: Colorado Ave & 8th Street

12/31/2024

Intersection

Intersection Delay, s/veh 18

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 33   | 343  | 66   | 27   | 365  | 69   | 47   | 10   | 31   | 38   | 20   | 22   |
| Future Vol, veh/h   | 33   | 343  | 66   | 27   | 365  | 69   | 47   | 10   | 31   | 38   | 20   | 22   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 0    | 2    | 12   | 2    | 4    | 0    | 11   | 0    | 0    | 0    | 0    | 0    |
| Mvmt Flow           | 36   | 373  | 72   | 29   | 397  | 75   | 51   | 11   | 34   | 41   | 22   | 24   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB | NB   | SB   |
|----------------------------|------|----|------|------|
| Opposing Approach          | WB   | EB | SB   | NB   |
| Opposing Lanes             | 1    | 1  | 1    | 1    |
| Conflicting Approach Left  | SB   | NB | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1  | 1    | 1    |
| Conflicting Approach Right | NB   | SB | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1  | 1    | 1    |
| HCM Control Delay          | 18.6 | 20 | 11.1 | 10.8 |
| HCM LOS                    | C    | C  | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 53%   | 7%    | 6%    | 47%   |
| Vol Thru, %            | 11%   | 78%   | 79%   | 25%   |
| Vol Right, %           | 35%   | 15%   | 15%   | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 88    | 442   | 461   | 80    |
| LT Vol                 | 47    | 33    | 27    | 38    |
| Through Vol            | 10    | 343   | 365   | 20    |
| RT Vol                 | 31    | 66    | 69    | 22    |
| Lane Flow Rate         | 96    | 480   | 501   | 87    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.176 | 0.684 | 0.714 | 0.157 |
| Departure Headway (Hd) | 6.613 | 5.129 | 5.13  | 6.493 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 539   | 701   | 702   | 550   |
| Service Time           | 4.688 | 3.175 | 3.176 | 4.567 |
| HCM Lane V/C Ratio     | 0.178 | 0.685 | 0.714 | 0.158 |
| HCM Control Delay      | 11.1  | 18.6  | 20    | 10.8  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.6   | 5.4   | 6     | 0.6   |

Intersection

Intersection Delay, s/veh 8  
Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 14   | 68   | 17   | 19   | 49   | 44   | 0    | 0    | 0    | 56   | 41   | 18   |
| Future Vol, veh/h   | 14   | 68   | 17   | 19   | 49   | 44   | 0    | 0    | 0    | 56   | 41   | 18   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 0    | 12   | 0    | 0    | 4    | 11   | 0    | 0    | 0    | 11   | 1    | 4    |
| Mvmt Flow           | 15   | 73   | 18   | 20   | 53   | 47   | 0    | 0    | 0    | 60   | 44   | 19   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB  |
|----------------------------|-----|-----|----|-----|
| Opposing Approach          | WB  | EB  | SB | NB  |
| Opposing Lanes             | 1   | 1   | 1  | 1   |
| Conflicting Approach Left  | SB  | NB  | EB | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1   |
| Conflicting Approach Right | NB  | SB  | WB | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1   |
| HCM Control Delay          | 7.9 | 7.8 | 0  | 8.4 |
| HCM LOS                    | A   | A   | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 17%   | 49%   |
| Vol Thru, %            | 100%  | 69%   | 44%   | 36%   |
| Vol Right, %           | 0%    | 17%   | 39%   | 16%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 99    | 112   | 115   |
| LT Vol                 | 0     | 14    | 19    | 56    |
| Through Vol            | 0     | 68    | 49    | 41    |
| RT Vol                 | 0     | 17    | 44    | 18    |
| Lane Flow Rate         | 0     | 106   | 120   | 124   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.126 | 0.138 | 0.157 |
| Departure Headway (Hd) | 4.538 | 4.249 | 4.111 | 4.58  |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 847   | 876   | 785   |
| Service Time           | 2.557 | 2.259 | 2.12  | 2.595 |
| HCM Lane V/C Ratio     | 0     | 0.125 | 0.137 | 0.158 |
| HCM Control Delay      | 7.6   | 7.9   | 7.8   | 8.4   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.5   | 0.6   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                     | EBL  | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|------|-------|------|------|------|-------|------|------|------|------|------|------|
| Lane Configurations          |      |       |      |      |      |       |      |      |      |      |      |      |
| Traffic Volume (veh/h)       | 51   | 13    | 54   | 34   | 17   | 98    | 47   | 1943 | 16   | 25   | 967  | 25   |
| Future Volume (veh/h)        | 51   | 13    | 54   | 34   | 17   | 98    | 47   | 1943 | 16   | 25   | 967  | 25   |
| Initial Q (Qb), veh          | 0    | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00 |       | 0.91 | 1.00 |      | 0.93  | 1.00 |      | 0.95 | 1.00 |      | 0.95 |
| Parking Bus, Adj             | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        | No   |       |      | No   |      |       | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       | 1870 | 1900  | 1781 | 1856 | 1900 | 1900  | 1826 | 1870 | 1900 | 1900 | 1870 | 1767 |
| Adj Flow Rate, veh/h         | 52   | 13    | 55   | 35   | 17   | 100   | 48   | 1983 | 16   | 26   | 987  | 26   |
| Peak Hour Factor             | 0.98 | 0.98  | 0.98 | 0.98 | 0.98 | 0.98  | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, %         | 2    | 0     | 8    | 3    | 0    | 0     | 5    | 2    | 0    | 0    | 2    | 9    |
| Cap, veh/h                   | 138  | 23    | 96   | 168  | 21   | 126   | 402  | 2531 | 20   | 153  | 2456 | 65   |
| Arrive On Green              | 0.08 | 0.08  | 0.08 | 0.10 | 0.10 | 0.10  | 0.03 | 0.70 | 0.70 | 0.02 | 0.70 | 0.70 |
| Sat Flow, veh/h              | 1781 | 293   | 1240 | 1767 | 224  | 1317  | 1739 | 3611 | 29   | 1810 | 3532 | 93   |
| Grp Volume(v), veh/h         | 52   | 0     | 68   | 35   | 0    | 117   | 48   | 974  | 1025 | 26   | 497  | 516  |
| Grp Sat Flow(s), veh/h/ln    | 1781 | 0     | 1533 | 1767 | 0    | 1541  | 1739 | 1777 | 1863 | 1810 | 1777 | 1848 |
| Q Serve(g_s), s              | 4.7  | 0.0   | 7.3  | 3.1  | 0.0  | 12.6  | 1.3  | 61.7 | 62.2 | 0.7  | 20.1 | 20.1 |
| Cycle Q Clear(g_c), s        | 4.7  | 0.0   | 7.3  | 3.1  | 0.0  | 12.6  | 1.3  | 61.7 | 62.2 | 0.7  | 20.1 | 20.1 |
| Prop In Lane                 | 1.00 |       | 0.81 | 1.00 |      | 0.85  | 1.00 |      | 0.02 | 1.00 |      | 0.05 |
| Lane Grp Cap(c), veh/h       | 138  | 0     | 118  | 168  | 0    | 147   | 402  | 1245 | 1306 | 153  | 1235 | 1285 |
| V/C Ratio(X)                 | 0.38 | 0.00  | 0.57 | 0.21 | 0.00 | 0.80  | 0.12 | 0.78 | 0.79 | 0.17 | 0.40 | 0.40 |
| Avail Cap(c_a), veh/h        | 194  | 0     | 167  | 194  | 0    | 170   | 414  | 1245 | 1306 | 185  | 1235 | 1285 |
| HCM Platoon Ratio            | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00 | 0.00  | 1.00 | 1.00 | 0.00 | 1.00  | 1.00 | 1.00 | 1.00 | 0.92 | 0.92 | 0.92 |
| Uniform Delay (d), s/veh     | 74.5 | 0.0   | 75.7 | 71.0 | 0.0  | 75.3  | 8.1  | 16.8 | 16.9 | 19.5 | 11.0 | 11.0 |
| Incr Delay (d2), s/veh       | 1.7  | 0.0   | 4.3  | 0.6  | 0.0  | 20.2  | 0.1  | 4.9  | 4.8  | 0.5  | 0.9  | 0.9  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 2.2  | 0.0   | 3.0  | 1.5  | 0.0  | 5.9   | 0.5  | 25.9 | 27.4 | 0.4  | 8.2  | 8.6  |
| Unsig. Movement Delay, s/veh |      |       |      |      |      |       |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         | 76.3 | 0.0   | 80.1 | 71.6 | 0.0  | 95.5  | 8.2  | 21.8 | 21.7 | 20.0 | 11.9 | 11.8 |
| LnGrp LOS                    | E    | A     | F    | E    | A    | F     | A    | C    | C    | B    | B    | B    |
| Approach Vol, veh/h          | 120  |       |      | 152  |      |       | 2047 |      |      | 1039 |      |      |
| Approach Delay, s/veh        | 78.4 |       |      | 90.0 |      |       | 21.4 |      |      | 12.0 |      |      |
| Approach LOS                 | E    |       |      | F    |      |       | C    |      |      | B    |      |      |
| Timer - Assigned Phs         | 1    | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 8.0  | 123.6 |      | 17.6 | 9.0  | 122.7 |      | 20.7 |      |      |      |      |
| Change Period (Y+Rc), s      | 4.5  | 4.5   |      | 4.5  | 4.5  | 4.5   |      | 4.5  |      |      |      |      |
| Max Green Setting (Gmax), s  | 6.5  | 108.3 |      | 18.5 | 5.7  | 109.1 |      | 18.7 |      |      |      |      |
| Max Q Clear Time (g_c+12, s) | 12.7 | 64.2  |      | 9.3  | 3.3  | 22.1  |      | 14.6 |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0  | 26.9  |      | 0.3  | 0.0  | 8.6   |      | 0.2  |      |      |      |      |
| <b>Intersection Summary</b>  |      |       |      |      |      |       |      |      |      |      |      |      |
| HCM 6th Ctrl Delay           |      |       |      | 23.7 |      |       |      |      |      |      |      |      |
| HCM 6th LOS                  |      |       |      | C    |      |       |      |      |      |      |      |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 51                                                                                | 13                                                                                | 54                                                                                | 34                                                                                | 17                                                                                | 98                                                                                | 47                                                                                  | 1943                                                                                | 16                                                                                  | 25                                                                                  | 967                                                                                 | 25                                                                                  |
| Future Volume (veh/h)         | 51                                                                                | 13                                                                                | 54                                                                                | 34                                                                                | 17                                                                                | 98                                                                                | 47                                                                                  | 1943                                                                                | 16                                                                                  | 25                                                                                  | 967                                                                                 | 25                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.91                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1900                                                                              | 1781                                                                              | 1856                                                                              | 1900                                                                              | 1900                                                                              | 1826                                                                                | 1870                                                                                | 1900                                                                                | 1900                                                                                | 1870                                                                                | 1767                                                                                |
| Adj Flow Rate, veh/h          | 52                                                                                | 13                                                                                | 55                                                                                | 35                                                                                | 17                                                                                | 100                                                                               | 48                                                                                  | 1983                                                                                | 16                                                                                  | 26                                                                                  | 987                                                                                 | 26                                                                                  |
| Peak Hour Factor              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 0                                                                                 | 8                                                                                 | 3                                                                                 | 0                                                                                 | 0                                                                                 | 5                                                                                   | 2                                                                                   | 0                                                                                   | 0                                                                                   | 2                                                                                   | 9                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 138                                                                               | 23                                                                                | 96                                                                                | 168                                                                               | 21                                                                                | 126                                                                               | 402                                                                                 | 2531                                                                                | 20                                                                                  | 153                                                                                 | 2456                                                                                | 65                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.03                                                                                | 0.70                                                                                | 0.70                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 76.3                                                                              | 0.0                                                                               | 80.1                                                                              | 71.6                                                                              | 0.0                                                                               | 95.5                                                                              | 8.2                                                                                 | 21.8                                                                                | 21.7                                                                                | 20.0                                                                                | 11.9                                                                                | 11.8                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | C                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 120                                                                               |                                                                                   |                                                                                   | 152                                                                               |                                                                                   |                                                                                   | 2047                                                                                |                                                                                     |                                                                                     | 1039                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.4                                                                              |                                                                                   |                                                                                   | 90.0                                                                              |                                                                                   |                                                                                   | 21.4                                                                                |                                                                                     |                                                                                     | 12.0                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 8.0                                                                               | 123.6                                                                             | 20.7                                                                              | 17.6                                                                              | 9.0                                                                               | 122.7                                                                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               | 108.3                                                                             | 18.7                                                                              | 18.5                                                                              | 5.7                                                                               | 109.1                                                                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.2                                                                               | 5.2                                                                               | 4.9                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.7                                                                               | 64.2                                                                              | 14.6                                                                              | 9.3                                                                               | 3.3                                                                               | 22.1                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 26.9                                                                              | 0.2                                                                               | 0.3                                                                               | 0.0                                                                               | 8.6                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.71                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.90                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.04                                                                              | 1.00                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1810                                                                              |                                                                                   | 1767                                                                              | 1781                                                                              | 1739                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 3611                                                                              | 224                                                                               | 293                                                                               |                                                                                   | 3532                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 12                                                                                | 18                                                                                | 14                                                                                |                                                                                   | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 29                                                                                | 1317                                                                              | 1240                                                                              |                                                                                   | 93                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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# HCM 6th Signalized Intersection Capacity Analysis

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|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 26    | 0    | 35   | 52   | 48    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1810  | 0    | 1767 | 1781 | 1739  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.7   | 0.0  | 3.1  | 4.7  | 1.3   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.7   | 0.0  | 3.1  | 4.7  | 1.3   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 219   | 0    | 1767 | 1781 | 543   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 118.2 | 0.0  | 0.0  | 0.0  | 118.2 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 56.9  | 0.0  | 0.0  | 0.0  | 98.1  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 8.3   | 0.0  | 0.0  | 0.0  | 1.9   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 153   | 0    | 168  | 138  | 402   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.17  | 0.00 | 0.21 | 0.38 | 0.12  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 185   | 0    | 194  | 194  | 414   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.92  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 19.5  | 0.0  | 71.0 | 74.5 | 8.1   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.5   | 0.0  | 0.6  | 1.7  | 0.1   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 20.0  | 0.0  | 71.6 | 76.3 | 8.2   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.4   | 0.0  | 1.4  | 2.2  | 0.5   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.4   | 0.0  | 1.5  | 2.2  | 0.5   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.09  | 0.00 | 0.50 | 0.76 | 0.09  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |

### Middle Lane Group Data

|                             |      |      |      |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt               | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment             | T    |      |      |      | T    |      |      |      |
| Lanes in Grp                | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h          | 0    | 974  | 0    | 0    | 0    | 497  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln  | 0    | 1777 | 0    | 0    | 0    | 1777 | 0    | 0    |
| Q Serve Time (g_s), s       | 0.0  | 61.7 | 0.0  | 0.0  | 0.0  | 20.1 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s | 0.0  | 61.7 | 0.0  | 0.0  | 0.0  | 20.1 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h     | 0    | 1245 | 0    | 0    | 0    | 1235 | 0    | 0    |
| V/C Ratio (X)               | 0.00 | 0.78 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h      | 0    | 1245 | 0    | 0    | 0    | 1235 | 0    | 0    |
| Upstream Filter (I)         | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh   | 0.0  | 16.8 | 0.0  | 0.0  | 0.0  | 11.0 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh      | 0.0  | 4.9  | 0.0  | 0.0  | 0.0  | 0.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh    | 0.0  | 21.8 | 0.0  | 0.0  | 0.0  | 11.9 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln     | 0.0  | 24.2 | 0.0  | 0.0  | 0.0  | 7.9  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln     | 0.0  | 1.7  | 0.0  | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

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|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 25.9 | 0.0  | 0.0  | 0.0  | 8.2  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.52 | 0.00 | 0.00 | 0.00 | 0.51 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 1025 | 117  | 68   | 0    | 516  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1863 | 1541 | 1533 | 0    | 1848 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 62.2 | 12.6 | 7.3  | 0.0  | 20.1 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 62.2 | 12.6 | 7.3  | 0.0  | 20.1 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.81 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1306 | 147  | 118  | 0    | 1285 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.79 | 0.80 | 0.57 | 0.00 | 0.40 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1306 | 170  | 167  | 0    | 1285 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 16.9 | 75.3 | 75.7 | 0.0  | 11.0 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 4.8  | 20.2 | 4.3  | 0.0  | 0.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 21.7 | 95.5 | 80.1 | 0.0  | 11.8 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 25.6 | 5.0  | 2.9  | 0.0  | 8.2  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.7  | 0.8  | 0.1  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 27.4 | 5.9  | 3.0  | 0.0  | 8.6  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.61 | 0.53 | 0.36 | 0.00 | 0.53 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 23.7 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|-------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 1.6    |       |       |        |      |       |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 4      | 137   | 6     | 1      | 173  | 0     | 18     | 3    | 4     | 13     | 2    | 13   |
| Future Vol, veh/h        | 4      | 137   | 6     | 1      | 173  | 0     | 18     | 3    | 4     | 13     | 2    | 13   |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 5     | 6     | 75     | 28   | 0     | 31     | 0    | 67    | 0      | 0    | 0    |
| Mvmt Flow                | 4      | 149   | 7     | 1      | 188  | 0     | 20     | 3    | 4     | 14     | 2    | 14   |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 188    | 0     | 0     | 156    | 0    | 0     | 359    | 351  | 153   | 354    | 354  | 188  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 161    | 161  | -     | 190    | 190  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 198    | 190  | -     | 164    | 164  | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.85   | -    | -     | 7.41   | 6.5  | 6.87  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.41   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.875  | -    | -     | 3.779  | 4    | 3.903 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1398   | -     | -     | 1079   | -    | -     | 546    | 577  | 748   | 605    | 574  | 859  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 777    | 769  | -     | 816    | 747  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 742    | 747  | -     | 843    | 766  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1398   | -     | -     | 1079   | -    | -     | 534    | 575  | 748   | 597    | 572  | 859  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 534    | 575  | -     | 597    | 572  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 775    | 767  | -     | 814    | 746  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 727    | 746  | -     | 832    | 764  | -    |
| Approach                 | EB     |       |       | WB     |      |       | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.2    |       |       | 0      |      |       | 11.6   |      |       | 10.4   |      |      |
| HCM LOS                  |        |       |       |        |      |       | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 539    | 748   | 1398  | -      | -    | 1079  | -      | -    | 693   |        |      |      |
| HCM Lane V/C Ratio       | 0.042  | 0.006 | 0.003 | -      | -    | 0.001 | -      | -    | 0.044 |        |      |      |
| HCM Control Delay (s)    | 12     | 9.8   | 7.6   | 0      | -    | 8.3   | 0      | -    | 10.4  |        |      |      |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -    | B     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -    | 0.1   |        |      |      |



HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 38.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 40                                                                                | 908                                                                               | 173                                                                               | 5                                                                                 | 390                                                                               | 28   | 225  | 0                                                                                 | 7    | 13   | 4                                                                                   | 12                                                                                  |
| Future Vol, veh/h        | 40                                                                                | 908                                                                               | 173                                                                               | 5                                                                                 | 390                                                                               | 28   | 225  | 0                                                                                 | 7    | 13   | 4                                                                                   | 12                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 2                                                                                 | 6                                                                                 | 19                                                                                | 2                                                                                 | 0    | 10   | 0                                                                                 | 25   | 23   | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 45                                                                                | 1020                                                                              | 194                                                                               | 6                                                                                 | 438                                                                               | 31   | 253  | 0                                                                                 | 8    | 15   | 4                                                                                   | 13                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |       | Minor2 |      |     |
|----------------------|--------|---|---|--------|---|---|--------|------|-------|--------|------|-----|
| Conflicting Flow All | 469    | 0 | 0 | 1216   | 0 | 0 | 1587   | 1593 | 1022  | 1677   | 1772 | 455 |
| Stage 1              | -      | - | - | -      | - | - | 1112   | 1112 | -     | 466    | 466  | -   |
| Stage 2              | -      | - | - | -      | - | - | 475    | 481  | -     | 1211   | 1306 | -   |
| Critical Hdwy        | 4.1    | - | - | 4.29   | - | - | 7.2    | 6.5  | 6.45  | 7.33   | 6.5  | 6.2 |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.2    | 5.5  | -     | 6.33   | 5.5  | -   |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.2    | 5.5  | -     | 6.33   | 5.5  | -   |
| Follow-up Hdwy       | 2.2    | - | - | 2.371  | - | - | 3.59   | 4    | 3.525 | 3.707  | 4    | 3.3 |
| Pot Cap-1 Maneuver   | 1103   | - | - | 518    | - | - | ~ 84   | 108  | 259   | 67     | 84   | 609 |
| Stage 1              | -      | - | - | -      | - | - | ~ 244  | 287  | -     | 539    | 566  | -   |
| Stage 2              | -      | - | - | -      | - | - | 556    | 557  | -     | 202    | 232  | -   |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -    | -     | -      | -    | -   |
| Mov Cap-1 Maneuver   | 1103   | - | - | 517    | - | - | ~ 77   | 102  | 259   | 62     | 79   | 608 |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | ~ 174  | 204  | -     | 143    | 169  | -   |
| Stage 1              | -      | - | - | -      | - | - | ~ 234  | 275  | -     | 517    | 559  | -   |
| Stage 2              | -      | - | - | -      | - | - | 533    | 550  | -     | 188    | 222  | -   |

| Approach             | EB  |  |  | WB  |  |  | NB    |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|-------|--|--|------|--|--|
| HCM Control Delay, s | 0.3 |  |  | 0.1 |  |  | 292.9 |  |  | 23.9 |  |  |
| HCM LOS              |     |  |  |     |  |  | F     |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 176   | 1103  | -   | -   | 517   | -   | -   | 148   | 608   |
| HCM Lane V/C Ratio    | 1.481 | 0.041 | -   | -   | 0.011 | -   | -   | 0.129 | 0.022 |
| HCM Control Delay (s) | 292.9 | 8.4   | -   | -   | 12    | -   | -   | 32.9  | 11.1  |
| HCM Lane LOS          | F     | A     | -   | -   | B     | -   | -   | D     | B     |
| HCM 95th %tile Q(veh) | 16.5  | 0.1   | -   | -   | 0     | -   | -   | 0.4   | 0.1   |

| Notes                      |  |  |                        |  |  |                            |  |  |                                |  |  |  |
|----------------------------|--|--|------------------------|--|--|----------------------------|--|--|--------------------------------|--|--|--|
| ~: Volume exceeds capacity |  |  | \$: Delay exceeds 300s |  |  | +: Computation Not Defined |  |  | *: All major volume in platoon |  |  |  |

Intersection

Intersection Delay, s/veh 19.1

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 14   | 385  | 64   | 119  | 273  | 71   | 48   | 17   | 18   | 19   | 24   | 25   |
| Future Vol, veh/h   | 14   | 385  | 64   | 119  | 273  | 71   | 48   | 17   | 18   | 19   | 24   | 25   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 6    | 3    | 22   | 2    | 7    | 0    | 15   | 0    | 0    | 0    | 0    | 6    |
| Mvmt Flow           | 15   | 418  | 70   | 129  | 297  | 77   | 52   | 18   | 20   | 21   | 26   | 27   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 20.6 | 20.3 | 11.3 | 10.5 |
| HCM LOS                    | C    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 58%   | 3%    | 26%   | 28%   |
| Vol Thru, %            | 20%   | 83%   | 59%   | 35%   |
| Vol Right, %           | 22%   | 14%   | 15%   | 37%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 83    | 463   | 463   | 68    |
| LT Vol                 | 48    | 14    | 119   | 19    |
| Through Vol            | 17    | 385   | 273   | 24    |
| RT Vol                 | 18    | 64    | 71    | 25    |
| Lane Flow Rate         | 90    | 503   | 503   | 74    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.171 | 0.723 | 0.719 | 0.133 |
| Departure Headway (Hd) | 6.804 | 5.172 | 5.143 | 6.459 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 525   | 700   | 700   | 552   |
| Service Time           | 4.875 | 3.215 | 3.187 | 4.534 |
| HCM Lane V/C Ratio     | 0.171 | 0.719 | 0.719 | 0.134 |
| HCM Control Delay      | 11.3  | 20.6  | 20.3  | 10.5  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.6   | 6.2   | 6.1   | 0.5   |

Intersection

Intersection Delay, s/veh 9.3

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 26   | 32   | 16   | 11   | 34   | 73   | 2    | 0    | 0    | 78   | 140  | 34   |
| Future Vol, veh/h   | 26   | 32   | 16   | 11   | 34   | 73   | 2    | 0    | 0    | 78   | 140  | 34   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 0    | 10   | 0    | 0    | 3    | 12   | 0    | 0    | 0    | 18   | 1    | 3    |
| Mvmt Flow           | 28   | 34   | 17   | 12   | 37   | 78   | 2    | 0    | 0    | 84   | 151  | 37   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB  | SB   |
|----------------------------|-----|-----|-----|------|
| Opposing Approach          | WB  | EB  | SB  | NB   |
| Opposing Lanes             | 1   | 1   | 1   | 1    |
| Conflicting Approach Left  | SB  | NB  | EB  | WB   |
| Conflicting Lanes Left     | 1   | 1   | 1   | 1    |
| Conflicting Approach Right | NB  | SB  | WB  | EB   |
| Conflicting Lanes Right    | 1   | 1   | 1   | 1    |
| HCM Control Delay          | 8.2 | 8.1 | 7.9 | 10.2 |
| HCM LOS                    | A   | A   | A   | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 9%    | 31%   |
| Vol Thru, %            | 0%    | 43%   | 29%   | 56%   |
| Vol Right, %           | 0%    | 22%   | 62%   | 13%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 2     | 74    | 118   | 252   |
| LT Vol                 | 2     | 26    | 11    | 78    |
| Through Vol            | 0     | 32    | 34    | 140   |
| RT Vol                 | 0     | 16    | 73    | 34    |
| Lane Flow Rate         | 2     | 80    | 127   | 271   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.003 | 0.103 | 0.152 | 0.35  |
| Departure Headway (Hd) | 4.892 | 4.657 | 4.317 | 4.656 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 731   | 770   | 832   | 772   |
| Service Time           | 2.926 | 2.681 | 2.338 | 2.68  |
| HCM Lane V/C Ratio     | 0.003 | 0.104 | 0.153 | 0.351 |
| HCM Control Delay      | 7.9   | 8.2   | 8.1   | 10.2  |
| HCM Lane LOS           | A     | A     | A     | B     |
| HCM 95th-tile Q        | 0     | 0.3   | 0.5   | 1.6   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                       | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations            |  |  |      |  |  |      |  |  |      |  |  |      |
| Traffic Volume (veh/h)         | 35                                                                                | 11                                                                                | 58   | 30                                                                                | 9                                                                                 | 38   | 79                                                                                | 1038                                                                              | 30   | 18                                                                                  | 981                                                                                 | 33   |
| Future Volume (veh/h)          | 35                                                                                | 11                                                                                | 58   | 30                                                                                | 9                                                                                 | 38   | 79                                                                                | 1038                                                                              | 30   | 18                                                                                  | 981                                                                                 | 33   |
| Initial Q (Qb), veh            | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)            | 1.00                                                                              |                                                                                   | 0.93 | 1.00                                                                              |                                                                                   | 0.92 | 0.99                                                                              |                                                                                   | 0.97 | 1.00                                                                                |                                                                                     | 0.97 |
| Parking Bus, Adj               | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Work Zone On Approach          | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                  |                                                                                     |      |
| Adj Sat Flow, veh/h/ln         | 1900                                                                              | 1900                                                                              | 1663 | 1900                                                                              | 1900                                                                              | 1900 | 1737                                                                              | 1826                                                                              | 1811 | 1826                                                                                | 1841                                                                                | 1900 |
| Adj Flow Rate, veh/h           | 36                                                                                | 11                                                                                | 60   | 31                                                                                | 9                                                                                 | 39   | 81                                                                                | 1070                                                                              | 31   | 19                                                                                  | 1011                                                                                | 34   |
| Peak Hour Factor               | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                                | 0.97                                                                                | 0.97 |
| Percent Heavy Veh, %           | 0                                                                                 | 0                                                                                 | 16   | 0                                                                                 | 0                                                                                 | 0    | 11                                                                                | 5                                                                                 | 6    | 5                                                                                   | 4                                                                                   | 0    |
| Cap, veh/h                     | 173                                                                               | 23                                                                                | 125  | 150                                                                               | 24                                                                                | 104  | 443                                                                               | 2135                                                                              | 62   | 332                                                                                 | 2057                                                                                | 69   |
| Arrive On Green                | 0.10                                                                              | 0.10                                                                              | 0.10 | 0.08                                                                              | 0.08                                                                              | 0.08 | 0.04                                                                              | 0.62                                                                              | 0.62 | 0.04                                                                                | 1.00                                                                                | 1.00 |
| Sat Flow, veh/h                | 1810                                                                              | 239                                                                               | 1306 | 1810                                                                              | 289                                                                               | 1252 | 1654                                                                              | 3439                                                                              | 100  | 1739                                                                                | 3448                                                                                | 116  |
| Grp Volume(v), veh/h           | 36                                                                                | 0                                                                                 | 71   | 31                                                                                | 0                                                                                 | 48   | 81                                                                                | 540                                                                               | 561  | 19                                                                                  | 513                                                                                 | 532  |
| Grp Sat Flow(s),veh/h/ln       | 1810                                                                              | 0                                                                                 | 1545 | 1810                                                                              | 0                                                                                 | 1541 | 1654                                                                              | 1735                                                                              | 1804 | 1739                                                                                | 1749                                                                                | 1815 |
| Q Serve(g_s), s                | 1.8                                                                               | 0.0                                                                               | 4.4  | 1.6                                                                               | 0.0                                                                               | 2.9  | 1.8                                                                               | 17.1                                                                              | 17.1 | 0.4                                                                                 | 0.0                                                                                 | 0.0  |
| Cycle Q Clear(g_c), s          | 1.8                                                                               | 0.0                                                                               | 4.4  | 1.6                                                                               | 0.0                                                                               | 2.9  | 1.8                                                                               | 17.1                                                                              | 17.1 | 0.4                                                                                 | 0.0                                                                                 | 0.0  |
| Prop In Lane                   | 1.00                                                                              |                                                                                   | 0.85 | 1.00                                                                              |                                                                                   | 0.81 | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                                |                                                                                     | 0.06 |
| Lane Grp Cap(c), veh/h         | 173                                                                               | 0                                                                                 | 148  | 150                                                                               | 0                                                                                 | 128  | 443                                                                               | 1077                                                                              | 1120 | 332                                                                                 | 1043                                                                                | 1083 |
| V/C Ratio(X)                   | 0.21                                                                              | 0.00                                                                              | 0.48 | 0.21                                                                              | 0.00                                                                              | 0.37 | 0.18                                                                              | 0.50                                                                              | 0.50 | 0.06                                                                                | 0.49                                                                                | 0.49 |
| Avail Cap(c_a), veh/h          | 328                                                                               | 0                                                                                 | 280  | 328                                                                               | 0                                                                                 | 279  | 476                                                                               | 1077                                                                              | 1120 | 385                                                                                 | 1043                                                                                | 1083 |
| HCM Platoon Ratio              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 2.00                                                                                | 2.00                                                                                | 2.00 |
| Upstream Filter(I)             | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.95                                                                                | 0.95                                                                                | 0.95 |
| Uniform Delay (d), s/veh       | 41.7                                                                              | 0.0                                                                               | 42.9 | 42.8                                                                              | 0.0                                                                               | 43.4 | 6.8                                                                               | 10.4                                                                              | 10.4 | 8.4                                                                                 | 0.0                                                                                 | 0.0  |
| Incr Delay (d2), s/veh         | 0.6                                                                               | 0.0                                                                               | 2.4  | 0.7                                                                               | 0.0                                                                               | 1.8  | 0.2                                                                               | 1.7                                                                               | 1.6  | 0.1                                                                                 | 1.6                                                                                 | 1.5  |
| Initial Q Delay(d3),s/veh      | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln       | 0.8                                                                               | 0.0                                                                               | 1.8  | 0.7                                                                               | 0.0                                                                               | 1.2  | 0.6                                                                               | 6.5                                                                               | 6.7  | 0.2                                                                                 | 0.5                                                                                 | 0.5  |
| Unsig. Movement Delay, s/veh   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| LnGrp Delay(d),s/veh           | 42.3                                                                              | 0.0                                                                               | 45.3 | 43.4                                                                              | 0.0                                                                               | 45.2 | 7.0                                                                               | 12.1                                                                              | 12.0 | 8.4                                                                                 | 1.6                                                                                 | 1.5  |
| LnGrp LOS                      | D                                                                                 | A                                                                                 | D    | D                                                                                 | A                                                                                 | D    | A                                                                                 | B                                                                                 | B    | A                                                                                   | A                                                                                   | A    |
| Approach Vol, veh/h            | 107                                                                               |                                                                                   | 79   |                                                                                   |                                                                                   | 1182 |                                                                                   |                                                                                   | 1064 |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh          | 44.3                                                                              |                                                                                   | 44.5 |                                                                                   |                                                                                   | 11.7 |                                                                                   |                                                                                   | 1.7  |                                                                                     |                                                                                     |      |
| Approach LOS                   | D                                                                                 |                                                                                   | D    |                                                                                   |                                                                                   | B    |                                                                                   |                                                                                   | A    |                                                                                     |                                                                                     |      |
| Timer - Assigned Phs           | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s       | 6.6                                                                               | 14.1                                                                              |      | 9.0                                                                               | 64.1                                                                              | 12.8 |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s        | 4.5                                                                               | 4.5                                                                               |      | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s    | 40.7                                                                              | 18.1                                                                              |      | 6.5                                                                               | 39.3                                                                              | 18.1 |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+12.4), s | 19.1                                                                              | 6.4                                                                               |      | 3.8                                                                               | 2.0                                                                               | 4.9  |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s        | 0.0                                                                               | 7.8                                                                               | 0.3  |                                                                                   | 0.0                                                                               | 8.5  | 0.2                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary           |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th Ctrl Delay             |                                                                                   |                                                                                   | 9.8  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th LOS                    |                                                                                   |                                                                                   | A    |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |   |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 35                                                                                | 11                                                                                | 58                                                                                | 30                                                                                | 9                                                                                 | 38                                                                                | 79                                                                                  | 1038                                                                                | 30                                                                                  | 18                                                                                  | 981                                                                                 | 33                                                                                  |
| Future Volume (veh/h)         | 35                                                                                | 11                                                                                | 58                                                                                | 30                                                                                | 9                                                                                 | 38                                                                                | 79                                                                                  | 1038                                                                                | 30                                                                                  | 18                                                                                  | 981                                                                                 | 33                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                              | 0.99                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1900                                                                              | 1663                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1737                                                                                | 1826                                                                                | 1811                                                                                | 1826                                                                                | 1841                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 36                                                                                | 11                                                                                | 60                                                                                | 31                                                                                | 9                                                                                 | 39                                                                                | 81                                                                                  | 1070                                                                                | 31                                                                                  | 19                                                                                  | 1011                                                                                | 34                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 0                                                                                 | 0                                                                                 | 16                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 11                                                                                  | 5                                                                                   | 6                                                                                   | 5                                                                                   | 4                                                                                   | 0                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 173                                                                               | 23                                                                                | 125                                                                               | 150                                                                               | 24                                                                                | 104                                                                               | 443                                                                                 | 2135                                                                                | 62                                                                                  | 332                                                                                 | 2057                                                                                | 69                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Prop Arrive On Green          | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.04                                                                                | 0.62                                                                                | 0.62                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 42.3                                                                              | 0.0                                                                               | 45.3                                                                              | 43.4                                                                              | 0.0                                                                               | 45.2                                                                              | 7.0                                                                                 | 12.1                                                                                | 12.0                                                                                | 8.4                                                                                 | 1.6                                                                                 | 1.5                                                                                 |
| Ln Grp LOS                    | D                                                                                 | A                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 107                                                                               |                                                                                   |                                                                                   | 79                                                                                |                                                                                   |                                                                                   | 1182                                                                                |                                                                                     |                                                                                     | 1064                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 44.3                                                                              |                                                                                   |                                                                                   | 44.5                                                                              |                                                                                   |                                                                                   | 11.7                                                                                |                                                                                     |                                                                                     | 1.7                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.6                                                                               | 66.6                                                                              | 12.8                                                                              | 14.1                                                                              | 9.0                                                                               | 64.1                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.1                                                                               | 40.7                                                                              | 18.1                                                                              | 18.1                                                                              | 6.5                                                                               | 39.3                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.3                                                                               | 4.9                                                                               | 5.0                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.4                                                                               | 19.1                                                                              | 4.9                                                                               | 6.4                                                                               | 3.8                                                                               | 2.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 7.8                                                                               | 0.2                                                                               | 0.3                                                                               | 0.0                                                                               | 8.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.41                                                                              | 1.00                                                                              | 0.92                                                                              | 0.96                                                                              | 0.89                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.01                                                                              | 1.00                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1739                                                                              |                                                                                   | 1810                                                                              | 1810                                                                              | 1654                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 3439                                                                              | 289                                                                               | 239                                                                               |                                                                                   | 3448                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 12                                                                                | 18                                                                                | 14                                                                                |                                                                                   | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 100                                                                               | 1252                                                                              | 1306                                                                              |                                                                                   | 116                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

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|                                     |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|
| Lanes in Grp                        | 1    | 0    | 1    | 1    | 1    | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 19   | 0    | 31   | 36   | 81   | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1739 | 0    | 1810 | 1810 | 1654 | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.4  | 0.0  | 1.6  | 1.8  | 1.8  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.4  | 0.0  | 1.6  | 1.8  | 1.8  | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 499  | 0    | 1810 | 1810 | 498  | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 59.6 | 0.0  | 0.0  | 0.0  | 59.6 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 44.9 | 0.0  | 0.0  | 0.0  | 59.6 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 332  | 0    | 150  | 173  | 443  | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.06 | 0.00 | 0.21 | 0.21 | 0.18 | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 385  | 0    | 328  | 328  | 476  | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 8.4  | 0.0  | 42.8 | 41.7 | 6.8  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1  | 0.0  | 0.7  | 0.6  | 0.2  | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 8.4  | 0.0  | 43.4 | 42.3 | 7.0  | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.1  | 0.0  | 0.7  | 0.8  | 0.6  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.2  | 0.0  | 0.7  | 0.8  | 0.6  | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.03 | 0.00 | 0.25 | 0.28 | 0.11 | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |      |      |      |      |      |      |      |      |
| Assigned Mvmt                       | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment                     | T    |      |      | T    |      |      |      |      |
| Lanes in Grp                        | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0    | 540  | 0    | 0    | 0    | 513  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0    | 1735 | 0    | 0    | 0    | 1749 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0  | 17.1 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0  | 17.1 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0    | 1077 | 0    | 0    | 0    | 1043 | 0    | 0    |
| V/C Ratio (X)                       | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0    | 1077 | 0    | 0    | 0    | 1043 | 0    | 0    |
| Upstream Filter (I)                 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0  | 10.4 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0  | 1.7  | 0.0  | 0.0  | 0.0  | 1.6  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0  | 12.1 | 0.0  | 0.0  | 0.0  | 1.6  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0  | 6.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.5  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 6.5  | 0.0  | 0.0  | 0.0  | 0.5  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.39 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 561  | 48   | 71   | 0    | 532  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1804 | 1541 | 1545 | 0    | 1815 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 17.1 | 2.9  | 4.4  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 17.1 | 2.9  | 4.4  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.85 | 0.00 | 0.06 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1120 | 128  | 148  | 0    | 1083 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.50 | 0.37 | 0.48 | 0.00 | 0.49 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1120 | 279  | 280  | 0    | 1083 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 10.4 | 43.4 | 42.9 | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.6  | 1.8  | 2.4  | 0.0  | 1.5  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 12.0 | 45.2 | 45.3 | 0.0  | 1.5  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 6.2  | 1.1  | 1.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.5  | 0.1  | 0.1  | 0.0  | 0.5  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 6.7  | 1.2  | 1.8  | 0.0  | 0.5  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.40 | 0.11 | 0.21 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |     |
|--------------------|-----|
| HCM 6th Ctrl Delay | 9.8 |
| HCM 6th LOS        | A   |



| Intersection             |        |       |       |        |      |       |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|-------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 2.1    |       |       |        |      |       |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 15     | 107   | 14    | 21     | 282  | 33    | 34     | 0    | 11    | 8      | 3    | 5    |
| Future Vol, veh/h        | 15     | 107   | 14    | 21     | 282  | 33    | 34     | 0    | 11    | 8      | 3    | 5    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 9     | 8     | 34     | 11   | 0     | 38     | 0    | 76    | 0      | 0    | 0    |
| Mvmt Flow                | 16     | 116   | 15    | 23     | 307  | 36    | 37     | 0    | 12    | 9      | 3    | 5    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 343    | 0     | 0     | 131    | 0    | 0     | 531    | 545  | 124   | 533    | 534  | 325  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 156    | 156  | -     | 371    | 371  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 375    | 389  | -     | 162    | 163  | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.44   | -    | -     | 7.48   | 6.5  | 6.96  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.48   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.48   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.506  | -    | -     | 3.842  | 4    | 3.984 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1227   | -     | -     | 1279   | -    | -     | 407    | 449  | 761   | 461    | 455  | 721  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 768    | 772  | -     | 653    | 623  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 579    | 612  | -     | 845    | 767  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1227   | -     | -     | 1279   | -    | -     | 391    | 433  | 761   | 441    | 439  | 721  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 391    | 433  | -     | 441    | 439  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 757    | 761  | -     | 644    | 609  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 559    | 599  | -     | 820    | 756  | -    |
| Approach                 | EB     |       |       | WB     |      |       | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.9    |       |       | 0.5    |      |       | 13.9   |      |       | 12.4   |      |      |
| HCM LOS                  |        |       |       |        |      |       | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 391    | 761   | 1227  | -      | -    | 1279  | -      | -    | 501   |        |      |      |
| HCM Lane V/C Ratio       | 0.095  | 0.016 | 0.013 | -      | -    | 0.018 | -      | -    | 0.035 |        |      |      |
| HCM Control Delay (s)    | 15.2   | 9.8   | 8     | 0      | -    | 7.9   | 0      | -    | 12.4  |        |      |      |
| HCM Lane LOS             | C      | A     | A     | A      | -    | A     | A      | -    | B     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.3    | 0     | 0     | -      | -    | 0.1   | -      | -    | 0.1   |        |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

| Intersection             |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------|-------|
| Int Delay, s/veh         | 1.9                                                                               |                                                                                   |                                                                                   |          |                                                                                   |       |
| Movement                 | SEL                                                                               | SET                                                                               | NWT                                                                               | NWR      | SWL                                                                               | SWR   |
| Lane Configurations      |  |  |  |          |  |       |
| Traffic Vol, veh/h       | 34                                                                                | 557                                                                               | 1092                                                                              | 31       | 30                                                                                | 54    |
| Future Vol, veh/h        | 34                                                                                | 557                                                                               | 1092                                                                              | 31       | 30                                                                                | 54    |
| Conflicting Peds, #/hr   | 2                                                                                 | 0                                                                                 | 0                                                                                 | 2        | 0                                                                                 | 0     |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free     | Stop                                                                              | Stop  |
| RT Channelized           | -                                                                                 | None                                                                              | -                                                                                 | None     | -                                                                                 | None  |
| Storage Length           | 100                                                                               | -                                                                                 | -                                                                                 | -        | 0                                                                                 | -     |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | 0                                                                                 | -        | 1                                                                                 | -     |
| Grade, %                 | -                                                                                 | 0                                                                                 | 0                                                                                 | -        | 0                                                                                 | -     |
| Peak Hour Factor         | 91                                                                                | 91                                                                                | 91                                                                                | 91       | 91                                                                                | 91    |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2        | 2                                                                                 | 2     |
| Mvmt Flow                | 37                                                                                | 612                                                                               | 1200                                                                              | 34       | 33                                                                                | 59    |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Major/Minor              | Major1                                                                            | Major2                                                                            |                                                                                   | Minor2   |                                                                                   |       |
| Conflicting Flow All     | 1236                                                                              | 0                                                                                 | -                                                                                 | 0        | 1905                                                                              | 1219  |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 1219                                                                              | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 686                                                                               | -     |
| Critical Hdwy            | 4.12                                                                              | -                                                                                 | -                                                                                 | -        | 6.42                                                                              | 6.22  |
| Critical Hdwy Stg 1      | -                                                                                 | -                                                                                 | -                                                                                 | -        | 5.42                                                                              | -     |
| Critical Hdwy Stg 2      | -                                                                                 | -                                                                                 | -                                                                                 | -        | 5.42                                                                              | -     |
| Follow-up Hdwy           | 2.218                                                                             | -                                                                                 | -                                                                                 | -        | 3.518                                                                             | 3.318 |
| Pot Cap-1 Maneuver       | 564                                                                               | -                                                                                 | -                                                                                 | -        | 75                                                                                | 220   |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 279                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 500                                                                               | -     |
| Platoon blocked, %       |                                                                                   | -                                                                                 | -                                                                                 | -        |                                                                                   |       |
| Mov Cap-1 Maneuver       | 563                                                                               | -                                                                                 | -                                                                                 | -        | 70                                                                                | 220   |
| Mov Cap-2 Maneuver       | -                                                                                 | -                                                                                 | -                                                                                 | -        | 184                                                                               | -     |
| Stage 1                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 260                                                                               | -     |
| Stage 2                  | -                                                                                 | -                                                                                 | -                                                                                 | -        | 499                                                                               | -     |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Approach                 | SE                                                                                | NW                                                                                |                                                                                   | SW       |                                                                                   |       |
| HCM Control Delay, s     | 0.7                                                                               | 0                                                                                 |                                                                                   | 35.9     |                                                                                   |       |
| HCM LOS                  | E                                                                                 |                                                                                   |                                                                                   |          |                                                                                   |       |
|                          |                                                                                   |                                                                                   |                                                                                   |          |                                                                                   |       |
| Minor Lane/Major Mvmt    | NWT                                                                               | NWR                                                                               | SEL                                                                               | SETSWLn1 |                                                                                   |       |
| Capacity (veh/h)         | -                                                                                 | -                                                                                 | 563                                                                               | -        | 206                                                                               |       |
| HCM Lane V/C Ratio       | -                                                                                 | -                                                                                 | 0.066                                                                             | -        | 0.448                                                                             |       |
| HCM Control Delay (s)    | -                                                                                 | -                                                                                 | 11.8                                                                              | -        | 35.9                                                                              |       |
| HCM Lane LOS             | -                                                                                 | -                                                                                 | B                                                                                 | -        | E                                                                                 |       |
| HCM 95th %tile Q(veh)    | -                                                                                 | -                                                                                 | 0.2                                                                               | -        | 2.1                                                                               |       |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 60.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 37                                                                                | 432                                                                               | 155                                                                               | 7                                                                                 | 850                                                                               | 43   | 222  | 1                                                                                 | 5    | 44   | 2                                                                                   | 59                                                                                  |
| Future Vol, veh/h        | 37                                                                                | 432                                                                               | 155                                                                               | 7                                                                                 | 850                                                                               | 43   | 222  | 1                                                                                 | 5    | 44   | 2                                                                                   | 59                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 2                                                                                 | 7                                                                                 | 11                                                                                | 1                                                                                 | 0    | 8    | 0                                                                                 | 34   | 0    | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 42                                                                                | 485                                                                               | 174                                                                               | 8                                                                                 | 955                                                                               | 48   | 249  | 1                                                                                 | 6    | 49   | 2                                                                                   | 66                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |       | Minor2 |      |     |
|----------------------|--------|---|---|--------|---|---|--------|------|-------|--------|------|-----|
| Conflicting Flow All | 1003   | 0 | 0 | 661    | 0 | 0 | 1601   | 1590 | 487   | 1655   | 1740 | 980 |
| Stage 1              | -      | - | - | -      | - | - | 571    | 571  | -     | 995    | 995  | -   |
| Stage 2              | -      | - | - | -      | - | - | 1030   | 1019 | -     | 660    | 745  | -   |
| Critical Hdwy        | 4.1    | - | - | 4.21   | - | - | 7.18   | 6.5  | 6.54  | 7.1    | 6.5  | 6.2 |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.18   | 5.5  | -     | 6.1    | 5.5  | -   |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.18   | 5.5  | -     | 6.1    | 5.5  | -   |
| Follow-up Hdwy       | 2.2    | - | - | 2.299  | - | - | 3.572  | 4    | 3.606 | 3.5    | 4    | 3.3 |
| Pot Cap-1 Maneuver   | 698    | - | - | 886    | - | - | ~ 83   | 109  | 521   | 79     | 88   | 306 |
| Stage 1              | -      | - | - | -      | - | - | 495    | 508  | -     | 297    | 325  | -   |
| Stage 2              | -      | - | - | -      | - | - | 275    | 317  | -     | 455    | 424  | -   |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -    | -     | -      | -    | -   |
| Mov Cap-1 Maneuver   | 698    | - | - | 884    | - | - | ~ 61   | 101  | 520   | 74     | 82   | 306 |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | ~ 134  | 199  | -     | 184    | 198  | -   |
| Stage 1              | -      | - | - | -      | - | - | 464    | 477  | -     | 279    | 322  | -   |
| Stage 2              | -      | - | - | -      | - | - | ~ 212  | 314  | -     | 422    | 398  | -   |

| Approach             | EB  |  |  | WB  |  |  | NB       |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|----------|--|--|------|--|--|
| HCM Control Delay, s | 0.6 |  |  | 0.1 |  |  | \$ 479.2 |  |  | 25.2 |  |  |
| HCM LOS              |     |  |  |     |  |  | F        |  |  | D    |  |  |

| Minor Lane/Major Mvmt | NBLn1    | EBL  | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|----------|------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 136      | 698  | -   | -   | 884   | -   | -   | 185   | 306   |
| HCM Lane V/C Ratio    | 1.884    | 0.06 | -   | -   | 0.009 | -   | -   | 0.279 | 0.217 |
| HCM Control Delay (s) | \$ 479.2 | 10.5 | -   | -   | 9.1   | -   | -   | 31.8  | 20    |
| HCM Lane LOS          | F        | B    | -   | -   | A     | -   | -   | D     | C     |
| HCM 95th %tile Q(veh) | 19.9     | 0.2  | -   | -   | 0     | -   | -   | 1.1   | 0.8   |

| Notes                      |  |  |                        |  |  |                            |  |  |                                |  |  |  |
|----------------------------|--|--|------------------------|--|--|----------------------------|--|--|--------------------------------|--|--|--|
| ~: Volume exceeds capacity |  |  | \$: Delay exceeds 300s |  |  | +: Computation Not Defined |  |  | *: All major volume in platoon |  |  |  |

Intersection

Intersection Delay, s/veh 21.5

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 31   | 345  | 69   | 25   | 360  | 64   | 53   | 10   | 29   | 35   | 18   | 22   |
| Future Vol, veh/h   | 31   | 345  | 69   | 25   | 360  | 64   | 53   | 10   | 29   | 35   | 18   | 22   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 3    | 15   | 0    | 3    | 0    | 23   | 11   | 0    | 2    | 0    | 7    |
| Mvmt Flow           | 36   | 401  | 80   | 29   | 419  | 74   | 62   | 12   | 34   | 41   | 21   | 26   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 23.3 | 23.3 | 12.1 | 11.2 |
| HCM LOS                    | C    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 58%   | 7%    | 6%    | 47%   |
| Vol Thru, %            | 11%   | 78%   | 80%   | 24%   |
| Vol Right, %           | 32%   | 16%   | 14%   | 29%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 92    | 445   | 449   | 75    |
| LT Vol                 | 53    | 31    | 25    | 35    |
| Through Vol            | 10    | 345   | 360   | 18    |
| RT Vol                 | 29    | 69    | 64    | 22    |
| Lane Flow Rate         | 107   | 517   | 522   | 87    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.212 | 0.76  | 0.762 | 0.166 |
| Departure Headway (Hd) | 7.15  | 5.285 | 5.254 | 6.862 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 505   | 678   | 684   | 526   |
| Service Time           | 5.15  | 3.357 | 3.325 | 4.868 |
| HCM Lane V/C Ratio     | 0.212 | 0.763 | 0.763 | 0.165 |
| HCM Control Delay      | 12.1  | 23.3  | 23.3  | 11.2  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.8   | 7     | 7.1   | 0.6   |

Intersection

Intersection Delay, s/veh 8.2

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 13   | 63   | 16   | 18   | 46   | 51   | 0    | 0    | 0    | 60   | 38   | 17   |
| Future Vol, veh/h   | 13   | 63   | 16   | 18   | 46   | 51   | 0    | 0    | 0    | 60   | 38   | 17   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 0    | 2    | 0    | 0    | 2    | 27   | 0    | 0    | 0    | 14   | 0    | 6    |
| Mvmt Flow           | 15   | 73   | 19   | 21   | 53   | 59   | 0    | 0    | 0    | 70   | 44   | 20   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB  |
|----------------------------|-----|-----|----|-----|
| Opposing Approach          | WB  | EB  | SB | NB  |
| Opposing Lanes             | 1   | 1   | 1  | 1   |
| Conflicting Approach Left  | SB  | NB  | EB | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1   |
| Conflicting Approach Right | NB  | SB  | WB | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1   |
| HCM Control Delay          | 7.9 | 7.9 | 0  | 8.7 |
| HCM LOS                    | A   | A   | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 16%   | 52%   |
| Vol Thru, %            | 100%  | 68%   | 40%   | 33%   |
| Vol Right, %           | 0%    | 17%   | 44%   | 15%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 92    | 115   | 115   |
| LT Vol                 | 0     | 13    | 18    | 60    |
| Through Vol            | 0     | 63    | 46    | 38    |
| RT Vol                 | 0     | 16    | 51    | 17    |
| Lane Flow Rate         | 0     | 107   | 134   | 134   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.128 | 0.153 | 0.174 |
| Departure Headway (Hd) | 4.585 | 4.293 | 4.112 | 4.673 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 838   | 875   | 770   |
| Service Time           | 2.607 | 2.305 | 2.123 | 2.69  |
| HCM Lane V/C Ratio     | 0     | 0.128 | 0.153 | 0.174 |
| HCM Control Delay      | 7.6   | 7.9   | 7.9   | 8.7   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.5   | 0.6   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                      | EBL  | EBT   | EBR  | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-------------------------------|------|-------|------|------|------|-------|------|------|------|------|------|------|
| Lane Configurations           |      |       |      |      |      |       |      |      |      |      |      |      |
| Traffic Volume (veh/h)        | 47   | 12    | 58   | 31   | 16   | 91    | 54   | 1809 | 15   | 24   | 902  | 24   |
| Future Volume (veh/h)         | 47   | 12    | 58   | 31   | 16   | 91    | 54   | 1809 | 15   | 24   | 902  | 24   |
| Initial Q (Qb), veh           | 0    | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)           | 1.00 |       | 0.91 | 1.00 |      | 0.93  | 1.00 |      | 0.97 | 1.00 |      | 0.97 |
| Parking Bus, Adj              | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach         | No   |       |      | No   |      |       | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln        | 1870 | 1900  | 1693 | 1856 | 1900 | 1900  | 1618 | 1870 | 1900 | 1900 | 1870 | 1781 |
| Adj Flow Rate, veh/h          | 48   | 12    | 60   | 32   | 16   | 94    | 56   | 1865 | 15   | 25   | 930  | 25   |
| Peak Hour Factor              | 0.97 | 0.97  | 0.97 | 0.97 | 0.97 | 0.97  | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, %          | 2    | 0     | 14   | 3    | 0    | 0     | 19   | 2    | 0    | 0    | 2    | 8    |
| Cap, veh/h                    | 140  | 20    | 100  | 164  | 21   | 122   | 383  | 2536 | 20   | 174  | 2456 | 66   |
| Arrive On Green               | 0.08 | 0.08  | 0.08 | 0.09 | 0.09 | 0.09  | 0.03 | 0.70 | 0.70 | 0.02 | 0.70 | 0.70 |
| Sat Flow, veh/h               | 1781 | 254   | 1272 | 1767 | 224  | 1315  | 1541 | 3612 | 29   | 1810 | 3532 | 95   |
| Grp Volume(v), veh/h          | 48   | 0     | 72   | 32   | 0    | 110   | 56   | 916  | 964  | 25   | 468  | 487  |
| Grp Sat Flow(s), veh/h/ln     | 1781 | 0     | 1527 | 1767 | 0    | 1539  | 1541 | 1777 | 1864 | 1810 | 1777 | 1850 |
| Q Serve(g_s), s               | 4.3  | 0.0   | 7.7  | 2.8  | 0.0  | 11.9  | 1.8  | 53.9 | 54.2 | 0.7  | 18.5 | 18.5 |
| Cycle Q Clear(g_c), s         | 4.3  | 0.0   | 7.7  | 2.8  | 0.0  | 11.9  | 1.8  | 53.9 | 54.2 | 0.7  | 18.5 | 18.5 |
| Prop In Lane                  | 1.00 |       | 0.83 | 1.00 |      | 0.85  | 1.00 |      | 0.02 | 1.00 |      | 0.05 |
| Lane Grp Cap(c), veh/h        | 140  | 0     | 120  | 164  | 0    | 143   | 383  | 1248 | 1309 | 174  | 1235 | 1286 |
| V/C Ratio(X)                  | 0.34 | 0.00  | 0.60 | 0.20 | 0.00 | 0.77  | 0.15 | 0.73 | 0.74 | 0.14 | 0.38 | 0.38 |
| Avail Cap(c_a), veh/h         | 194  | 0     | 166  | 194  | 0    | 169   | 392  | 1248 | 1309 | 199  | 1235 | 1286 |
| HCM Platoon Ratio             | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)            | 1.00 | 0.00  | 1.00 | 1.00 | 0.00 | 1.00  | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Uniform Delay (d), s/veh      | 74.1 | 0.0   | 75.7 | 71.3 | 0.0  | 75.4  | 7.9  | 15.6 | 15.6 | 16.2 | 10.7 | 10.7 |
| Incr Delay (d2), s/veh        | 1.4  | 0.0   | 4.7  | 0.6  | 0.0  | 16.5  | 0.2  | 3.9  | 3.7  | 0.4  | 0.8  | 0.8  |
| Initial Q Delay(d3), s/veh    | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 2.1  | 0.0   | 3.2  | 1.3  | 0.0  | 5.4   | 0.6  | 22.5 | 23.7 | 0.3  | 7.6  | 7.9  |
| Unsig. Movement Delay, s/veh  |      |       |      |      |      |       |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh          | 75.6 | 0.0   | 80.4 | 71.8 | 0.0  | 91.9  | 8.1  | 19.4 | 19.3 | 16.5 | 11.6 | 11.5 |
| LnGrp LOS                     | E    | A     | F    | E    | A    | F     | A    | B    | B    | B    | B    | B    |
| Approach Vol, veh/h           | 120  |       |      | 142  |      |       | 1936 |      |      | 980  |      |      |
| Approach Delay, s/veh         | 78.5 |       |      | 87.3 |      |       | 19.1 |      |      | 11.7 |      |      |
| Approach LOS                  | E    |       |      | F    |      |       | B    |      |      | B    |      |      |
| Timer - Assigned Phs          | 1    | 2     |      | 4    | 5    | 6     |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s      | 8.0  | 123.9 |      | 17.9 | 9.1  | 122.7 |      | 20.3 |      |      |      |      |
| Change Period (Y+Rc), s       | 4.5  | 4.5   |      | 4.5  | 4.5  | 4.5   |      | 4.5  |      |      |      |      |
| Max Green Setting (Gmax), s   | 5.9  | 108.3 |      | 18.5 | 5.7  | 109.1 |      | 18.7 |      |      |      |      |
| Max Q Clear Time (g_c+1/2, s) | 12.3 | 56.2  |      | 9.7  | 3.8  | 20.5  |      | 13.9 |      |      |      |      |
| Green Ext Time (p_c), s       | 0.0  | 26.3  |      | 0.3  | 0.0  | 7.9   |      | 0.3  |      |      |      |      |
| <b>Intersection Summary</b>   |      |       |      |      |      |       |      |      |      |      |      |      |
| HCM 6th Ctrl Delay            |      |       |      | 22.1 |      |       |      |      |      |      |      |      |
| HCM 6th LOS                   |      |       |      | C    |      |       |      |      |      |      |      |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 47                                                                                | 12                                                                                | 58                                                                                | 31                                                                                | 16                                                                                | 91                                                                                | 54                                                                                  | 1809                                                                                | 15                                                                                  | 24                                                                                  | 902                                                                                 | 24                                                                                  |
| Future Volume (veh/h)         | 47                                                                                | 12                                                                                | 58                                                                                | 31                                                                                | 16                                                                                | 91                                                                                | 54                                                                                  | 1809                                                                                | 15                                                                                  | 24                                                                                  | 902                                                                                 | 24                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.91                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1900                                                                              | 1693                                                                              | 1856                                                                              | 1900                                                                              | 1900                                                                              | 1618                                                                                | 1870                                                                                | 1900                                                                                | 1900                                                                                | 1870                                                                                | 1781                                                                                |
| Adj Flow Rate, veh/h          | 48                                                                                | 12                                                                                | 60                                                                                | 32                                                                                | 16                                                                                | 94                                                                                | 56                                                                                  | 1865                                                                                | 15                                                                                  | 25                                                                                  | 930                                                                                 | 25                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 0                                                                                 | 14                                                                                | 3                                                                                 | 0                                                                                 | 0                                                                                 | 19                                                                                  | 2                                                                                   | 0                                                                                   | 0                                                                                   | 2                                                                                   | 8                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 140                                                                               | 20                                                                                | 100                                                                               | 164                                                                               | 21                                                                                | 122                                                                               | 383                                                                                 | 2536                                                                                | 20                                                                                  | 174                                                                                 | 2456                                                                                | 66                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.03                                                                                | 0.70                                                                                | 0.70                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 75.6                                                                              | 0.0                                                                               | 80.4                                                                              | 71.8                                                                              | 0.0                                                                               | 91.9                                                                              | 8.1                                                                                 | 19.4                                                                                | 19.3                                                                                | 16.5                                                                                | 11.6                                                                                | 11.5                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 120                                                                               |                                                                                   |                                                                                   | 142                                                                               |                                                                                   |                                                                                   | 1936                                                                                |                                                                                     |                                                                                     | 980                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.5                                                                              |                                                                                   |                                                                                   | 87.3                                                                              |                                                                                   |                                                                                   | 19.1                                                                                |                                                                                     |                                                                                     | 11.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 8.0                                                                               | 123.9                                                                             | 20.3                                                                              | 17.9                                                                              | 9.1                                                                               | 122.7                                                                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.9                                                                               | 108.3                                                                             | 18.7                                                                              | 18.5                                                                              | 5.7                                                                               | 109.1                                                                             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.2                                                                               | 5.3                                                                               | 4.9                                                                               | 3.9                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.7                                                                               | 56.2                                                                              | 13.9                                                                              | 9.7                                                                               | 3.8                                                                               | 20.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 26.3                                                                              | 0.3                                                                               | 0.3                                                                               | 0.0                                                                               | 7.9                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.69                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.93                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 1.00                                                                              | 0.07                                                                              | 1.00                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1810                                                                              |                                                                                   | 1767                                                                              | 1781                                                                              | 1541                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 3612                                                                              | 224                                                                               | 254                                                                               |                                                                                   | 3532                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 12                                                                                | 18                                                                                | 14                                                                                |                                                                                   | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 29                                                                                | 1315                                                                              | 1272                                                                              |                                                                                   | 95                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 25    | 0    | 32   | 48   | 56    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1810  | 0    | 1767 | 1781 | 1541  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.7   | 0.0  | 2.8  | 4.3  | 1.8   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.7   | 0.0  | 2.8  | 4.3  | 1.8   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 246   | 0    | 1767 | 1781 | 509   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 118.2 | 0.0  | 0.0  | 0.0  | 118.2 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 65.2  | 0.0  | 0.0  | 0.0  | 99.7  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 6.0   | 0.0  | 0.0  | 0.0  | 2.3   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 174   | 0    | 164  | 140  | 383   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.14  | 0.00 | 0.20 | 0.34 | 0.15  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 199   | 0    | 194  | 194  | 392   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 16.2  | 0.0  | 71.3 | 74.1 | 7.9   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.4   | 0.0  | 0.6  | 1.4  | 0.2   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 16.5  | 0.0  | 71.8 | 75.6 | 8.1   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.3   | 0.0  | 1.3  | 2.0  | 0.6   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.3   | 0.0  | 1.3  | 2.1  | 0.6   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.07  | 0.00 | 0.45 | 0.70 | 0.12  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |

### Middle Lane Group Data

|                             |      |      |      |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt               | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment             | T    |      |      |      | T    |      |      |      |
| Lanes in Grp                | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h          | 0    | 916  | 0    | 0    | 0    | 468  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln  | 0    | 1777 | 0    | 0    | 0    | 1777 | 0    | 0    |
| Q Serve Time (g_s), s       | 0.0  | 53.9 | 0.0  | 0.0  | 0.0  | 18.5 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s | 0.0  | 53.9 | 0.0  | 0.0  | 0.0  | 18.5 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h     | 0    | 1248 | 0    | 0    | 0    | 1235 | 0    | 0    |
| V/C Ratio (X)               | 0.00 | 0.73 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h      | 0    | 1248 | 0    | 0    | 0    | 1235 | 0    | 0    |
| Upstream Filter (I)         | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh   | 0.0  | 15.6 | 0.0  | 0.0  | 0.0  | 10.7 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh      | 0.0  | 3.9  | 0.0  | 0.0  | 0.0  | 0.8  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh    | 0.0  | 19.4 | 0.0  | 0.0  | 0.0  | 11.6 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln     | 0.0  | 21.1 | 0.0  | 0.0  | 0.0  | 7.3  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln     | 0.0  | 1.3  | 0.0  | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 22.5 | 0.0  | 0.0  | 0.0  | 7.6  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.32 | 0.00 | 0.00 | 0.00 | 0.47 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 964  | 110  | 72   | 0    | 487  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1864 | 1539 | 1527 | 0    | 1850 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 54.2 | 11.9 | 7.7  | 0.0  | 18.5 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 54.2 | 11.9 | 7.7  | 0.0  | 18.5 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.83 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1309 | 143  | 120  | 0    | 1286 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.74 | 0.77 | 0.60 | 0.00 | 0.38 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1309 | 169  | 166  | 0    | 1286 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 15.6 | 75.4 | 75.7 | 0.0  | 10.7 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 3.7  | 16.5 | 4.7  | 0.0  | 0.8  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 19.3 | 91.9 | 80.4 | 0.0  | 11.5 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 22.3 | 4.7  | 3.1  | 0.0  | 7.6  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.4  | 0.7  | 0.2  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 23.7 | 5.4  | 3.2  | 0.0  | 7.9  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.39 | 0.49 | 0.38 | 0.00 | 0.49 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 22.1 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|-------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 2.6    |       |       |        |      |       |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 4      | 145   | 9     | 6      | 185  | 2     | 37     | 3    | 12    | 18     | 3    | 18   |
| Future Vol, veh/h        | 4      | 145   | 9     | 6      | 185  | 2     | 37     | 3    | 12    | 18     | 3    | 18   |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 21    | 4     | 69     | 10   | 10    | 17     | 0    | 33    | 0      | 0    | 0    |
| Mvmt Flow                | 4      | 158   | 10    | 7      | 201  | 2     | 40     | 3    | 13    | 20     | 3    | 20   |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 203    | 0     | 0     | 168    | 0    | 0     | 399    | 388  | 163   | 395    | 392  | 202  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 171    | 171  | -     | 216    | 216  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 228    | 217  | -     | 179    | 176  | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.79   | -    | -     | 7.27   | 6.5  | 6.53  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.27   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.27   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.821  | -    | -     | 3.653  | 4    | 3.597 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1381   | -     | -     | 1089   | -    | -     | 535    | 550  | 807   | 568    | 547  | 844  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 797    | 761  | -     | 791    | 728  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 742    | 727  | -     | 827    | 757  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1381   | -     | -     | 1089   | -    | -     | 516    | 545  | 807   | 552    | 542  | 844  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 516    | 545  | -     | 552    | 542  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 795    | 759  | -     | 789    | 723  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 716    | 722  | -     | 808    | 755  | -    |
| Approach                 | EB     |       |       | WB     |      |       | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.2    |       |       | 0.3    |      |       | 11.9   |      |       | 10.9   |      |      |
| HCM LOS                  |        |       |       |        |      |       | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 518    | 807   | 1381  | -      | -    | 1089  | -      | -    | 656   |        |      |      |
| HCM Lane V/C Ratio       | 0.084  | 0.016 | 0.003 | -      | -    | 0.006 | -      | -    | 0.065 |        |      |      |
| HCM Control Delay (s)    | 12.6   | 9.5   | 7.6   | 0      | -    | 8.3   | 0      | -    | 10.9  |        |      |      |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -    | B     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.3    | 0     | 0     | -      | -    | 0     | -      | -    | 0.2   |        |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

Intersection

Int Delay, s/veh 0.8

Movement SEL SET NWT NWR SWL SWR

Lane Configurations 

Traffic Vol, veh/h 59 1342 576 13 21 15

Future Vol, veh/h 59 1342 576 13 21 15

Conflicting Peds, #/hr 2 0 0 2 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length 100 - - - 0 -

Veh in Median Storage, # - 0 0 - 1 -

Grade, % - 0 0 - 0 -

Peak Hour Factor 91 91 91 91 91 91

Heavy Vehicles, % 2 2 2 2 2 2

Mvmt Flow 65 1475 633 14 23 16

Major/Minor Major1 Major2 Minor2

Conflicting Flow All 649 0 - 0 2247 642

Stage 1 - - - - 642 -

Stage 2 - - - - 1605 -

Critical Hdwy 4.12 - - - 6.42 6.22

Critical Hdwy Stg 1 - - - - 5.42 -

Critical Hdwy Stg 2 - - - - 5.42 -

Follow-up Hdwy 2.218 - - - 3.518 3.318

Pot Cap-1 Maneuver 937 - - - 46 474

Stage 1 - - - - 524 -

Stage 2 - - - - 181 -

Platoon blocked, % - - - -

Mov Cap-1 Maneuver 935 - - - 43 473

Mov Cap-2 Maneuver - - - - 135 -

Stage 1 - - - - 486 -

Stage 2 - - - - 181 -

Approach SE NW SW

HCM Control Delay, s 0.4 0 28.6

HCM LOS D

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h) - - 935 - 192

HCM Lane V/C Ratio - - 0.069 - 0.206

HCM Control Delay (s) - - 9.1 - 28.6

HCM Lane LOS - - A - D

HCM 95th %tile Q(veh) - - 0.2 - 0.7

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 45.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 40                                                                                | 978                                                                               | 173                                                                               | 5                                                                                 | 418                                                                               | 30   | 225  | 0                                                                                 | 7    | 13   | 4                                                                                   | 12                                                                                  |
| Future Vol, veh/h        | 40                                                                                | 978                                                                               | 173                                                                               | 5                                                                                 | 418                                                                               | 30   | 225  | 0                                                                                 | 7    | 13   | 4                                                                                   | 12                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 2                                                                                 | 6                                                                                 | 19                                                                                | 2                                                                                 | 0    | 10   | 0                                                                                 | 25   | 23   | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 45                                                                                | 1099                                                                              | 194                                                                               | 6                                                                                 | 470                                                                               | 34   | 253  | 0                                                                                 | 8    | 15   | 4                                                                                   | 13                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |       | Minor2 |      |     |
|----------------------|--------|---|---|--------|---|---|--------|------|-------|--------|------|-----|
| Conflicting Flow All | 504    | 0 | 0 | 1295   | 0 | 0 | 1700   | 1707 | 1101  | 1789   | 1884 | 488 |
| Stage 1              | -      | - | - | -      | - | - | 1191   | 1191 | -     | 499    | 499  | -   |
| Stage 2              | -      | - | - | -      | - | - | 509    | 516  | -     | 1290   | 1385 | -   |
| Critical Hdwy        | 4.1    | - | - | 4.29   | - | - | 7.2    | 6.5  | 6.45  | 7.33   | 6.5  | 6.2 |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.2    | 5.5  | -     | 6.33   | 5.5  | -   |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.2    | 5.5  | -     | 6.33   | 5.5  | -   |
| Follow-up Hdwy       | 2.2    | - | - | 2.371  | - | - | 3.59   | 4    | 3.525 | 3.707  | 4    | 3.3 |
| Pot Cap-1 Maneuver   | 1071   | - | - | 482    | - | - | ~ 69   | 92   | 232   | 56     | 72   | 584 |
| Stage 1              | -      | - | - | -      | - | - | ~ 220  | 263  | -     | 516    | 547  | -   |
| Stage 2              | -      | - | - | -      | - | - | 532    | 538  | -     | 182    | 213  | -   |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -    | -     | -      | -    | -   |
| Mov Cap-1 Maneuver   | 1071   | - | - | 481    | - | - | ~ 63   | 87   | 232   | 52     | 68   | 583 |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | ~ 156  | 186  | -     | 128    | 155  | -   |
| Stage 1              | -      | - | - | -      | - | - | ~ 210  | 251  | -     | 494    | 540  | -   |
| Stage 2              | -      | - | - | -      | - | - | 508    | 532  | -     | 168    | 204  | -   |

| Approach             | EB  |  |  | WB  |  |  | NB       |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|----------|--|--|------|--|--|
| HCM Control Delay, s | 0.3 |  |  | 0.1 |  |  | \$ 369.7 |  |  | 26.1 |  |  |
| HCM LOS              |     |  |  |     |  |  | F        |  |  | D    |  |  |

| Minor Lane/Major Mvmt | NBLn1    | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|----------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 158      | 1071  | -   | -   | 481   | -   | -   | 133   | 583   |
| HCM Lane V/C Ratio    | 1.65     | 0.042 | -   | -   | 0.012 | -   | -   | 0.144 | 0.023 |
| HCM Control Delay (s) | \$ 369.7 | 8.5   | -   | -   | 12.6  | -   | -   | 36.6  | 11.3  |
| HCM Lane LOS          | F        | A     | -   | -   | B     | -   | -   | E     | B     |
| HCM 95th %tile Q(veh) | 18.2     | 0.1   | -   | -   | 0     | -   | -   | 0.5   | 0.1   |

| Notes                      |  |  |                        |  |  |                            |  |  |                                |  |  |  |
|----------------------------|--|--|------------------------|--|--|----------------------------|--|--|--------------------------------|--|--|--|
| ~: Volume exceeds capacity |  |  | \$: Delay exceeds 300s |  |  | +: Computation Not Defined |  |  | *: All major volume in platoon |  |  |  |

Intersection

Intersection Delay, s/veh 22.4

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 15   | 400  | 68   | 128  | 287  | 77   | 51   | 18   | 19   | 21   | 26   | 27   |
| Future Vol, veh/h   | 15   | 400  | 68   | 128  | 287  | 77   | 51   | 18   | 19   | 21   | 26   | 27   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 6    | 3    | 22   | 2    | 7    | 0    | 15   | 0    | 0    | 0    | 0    | 6    |
| Mvmt Flow           | 16   | 435  | 74   | 139  | 312  | 84   | 55   | 20   | 21   | 23   | 28   | 29   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB | WB   | NB   | SB   |
|----------------------------|----|------|------|------|
| Opposing Approach          | WB | EB   | SB   | NB   |
| Opposing Lanes             | 1  | 1    | 1    | 1    |
| Conflicting Approach Left  | SB | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1  | 1    | 1    | 1    |
| Conflicting Approach Right | NB | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1  | 1    | 1    | 1    |
| HCM Control Delay          | 24 | 24.5 | 11.7 | 10.9 |
| HCM LOS                    | C  | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 58%   | 3%    | 26%   | 28%   |
| Vol Thru, %            | 20%   | 83%   | 58%   | 35%   |
| Vol Right, %           | 22%   | 14%   | 16%   | 36%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 88    | 483   | 492   | 74    |
| LT Vol                 | 51    | 15    | 128   | 21    |
| Through Vol            | 18    | 400   | 287   | 26    |
| RT Vol                 | 19    | 68    | 77    | 27    |
| Lane Flow Rate         | 96    | 525   | 535   | 80    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.186 | 0.772 | 0.78  | 0.149 |
| Departure Headway (Hd) | 6.997 | 5.293 | 5.252 | 6.656 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 510   | 682   | 685   | 535   |
| Service Time           | 5.085 | 3.346 | 3.306 | 4.748 |
| HCM Lane V/C Ratio     | 0.188 | 0.77  | 0.781 | 0.15  |
| HCM Control Delay      | 11.7  | 24    | 24.5  | 10.9  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.7   | 7.3   | 7.6   | 0.5   |

Intersection

Intersection Delay, s/veh 9.6

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 28   | 34   | 17   | 12   | 37   | 78   | 3    | 0    | 0    | 83   | 151  | 37   |
| Future Vol, veh/h   | 28   | 34   | 17   | 12   | 37   | 78   | 3    | 0    | 0    | 83   | 151  | 37   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 0    | 10   | 0    | 0    | 3    | 12   | 0    | 0    | 0    | 18   | 1    | 3    |
| Mvmt Flow           | 30   | 37   | 18   | 13   | 40   | 84   | 3    | 0    | 0    | 89   | 162  | 40   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB   |
|----------------------------|-----|-----|----|------|
| Opposing Approach          | WB  | EB  | SB | NB   |
| Opposing Lanes             | 1   | 1   | 1  | 1    |
| Conflicting Approach Left  | SB  | NB  | EB | WB   |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1    |
| Conflicting Approach Right | NB  | SB  | WB | EB   |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1    |
| HCM Control Delay          | 8.4 | 8.3 | 8  | 10.6 |
| HCM LOS                    | A   | A   | A  | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 9%    | 31%   |
| Vol Thru, %            | 0%    | 43%   | 29%   | 56%   |
| Vol Right, %           | 0%    | 22%   | 61%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 3     | 79    | 127   | 271   |
| LT Vol                 | 3     | 28    | 12    | 83    |
| Through Vol            | 0     | 34    | 37    | 151   |
| RT Vol                 | 0     | 17    | 78    | 37    |
| Lane Flow Rate         | 3     | 85    | 137   | 291   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.004 | 0.112 | 0.166 | 0.38  |
| Departure Headway (Hd) | 4.96  | 4.73  | 4.384 | 4.693 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 720   | 758   | 818   | 766   |
| Service Time           | 3.003 | 2.759 | 2.411 | 2.723 |
| HCM Lane V/C Ratio     | 0.004 | 0.112 | 0.167 | 0.38  |
| HCM Control Delay      | 8     | 8.4   | 8.3   | 10.6  |
| HCM Lane LOS           | A     | A     | A     | B     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.6   | 1.8   |



# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                     | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations          |  |  |      |  |  |      |  |  |      |  |  |      |
| Traffic Volume (veh/h)       | 38                                                                                | 12                                                                                | 81   | 33                                                                                | 10                                                                                | 41   | 85                                                                                | 1116                                                                              | 33   | 19                                                                                  | 1052                                                                                | 35   |
| Future Volume (veh/h)        | 38                                                                                | 12                                                                                | 81   | 33                                                                                | 10                                                                                | 41   | 85                                                                                | 1116                                                                              | 33   | 19                                                                                  | 1052                                                                                | 35   |
| Initial Q (Qb), veh          | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00                                                                              |                                                                                   | 0.94 | 1.00                                                                              |                                                                                   | 0.92 | 0.99                                                                              |                                                                                   | 0.97 | 1.00                                                                                |                                                                                     | 0.97 |
| Parking Bus, Adj             | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Work Zone On Approach        | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |      | No                                                                                  |                                                                                     |      |
| Adj Sat Flow, veh/h/ln       | 1900                                                                              | 1900                                                                              | 1663 | 1900                                                                              | 1900                                                                              | 1900 | 1737                                                                              | 1826                                                                              | 1811 | 1826                                                                                | 1841                                                                                | 1900 |
| Adj Flow Rate, veh/h         | 39                                                                                | 12                                                                                | 84   | 34                                                                                | 10                                                                                | 42   | 88                                                                                | 1151                                                                              | 34   | 20                                                                                  | 1085                                                                                | 36   |
| Peak Hour Factor             | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                                | 0.97                                                                                | 0.97 |
| Percent Heavy Veh, %         | 0                                                                                 | 0                                                                                 | 16   | 0                                                                                 | 0                                                                                 | 0    | 11                                                                                | 5                                                                                 | 6    | 5                                                                                   | 4                                                                                   | 0    |
| Cap, veh/h                   | 197                                                                               | 21                                                                                | 147  | 155                                                                               | 25                                                                                | 107  | 416                                                                               | 2078                                                                              | 61   | 296                                                                                 | 2002                                                                                | 66   |
| Arrive On Green              | 0.11                                                                              | 0.11                                                                              | 0.11 | 0.09                                                                              | 0.09                                                                              | 0.09 | 0.05                                                                              | 0.60                                                                              | 0.60 | 0.04                                                                                | 1.00                                                                                | 1.00 |
| Sat Flow, veh/h              | 1810                                                                              | 193                                                                               | 1354 | 1810                                                                              | 297                                                                               | 1249 | 1654                                                                              | 3437                                                                              | 101  | 1739                                                                                | 3450                                                                                | 114  |
| Grp Volume(v), veh/h         | 39                                                                                | 0                                                                                 | 96   | 34                                                                                | 0                                                                                 | 52   | 88                                                                                | 581                                                                               | 604  | 20                                                                                  | 550                                                                                 | 571  |
| Grp Sat Flow(s),veh/h/ln     | 1810                                                                              | 0                                                                                 | 1548 | 1810                                                                              | 0                                                                                 | 1546 | 1654                                                                              | 1735                                                                              | 1804 | 1739                                                                                | 1749                                                                                | 1816 |
| Q Serve(g_s), s              | 2.0                                                                               | 0.0                                                                               | 5.9  | 1.8                                                                               | 0.0                                                                               | 3.2  | 2.1                                                                               | 19.9                                                                              | 19.9 | 0.5                                                                                 | 0.0                                                                                 | 0.0  |
| Cycle Q Clear(g_c), s        | 2.0                                                                               | 0.0                                                                               | 5.9  | 1.8                                                                               | 0.0                                                                               | 3.2  | 2.1                                                                               | 19.9                                                                              | 19.9 | 0.5                                                                                 | 0.0                                                                                 | 0.0  |
| Prop In Lane                 | 1.00                                                                              |                                                                                   | 0.88 | 1.00                                                                              |                                                                                   | 0.81 | 1.00                                                                              |                                                                                   | 0.06 | 1.00                                                                                |                                                                                     | 0.06 |
| Lane Grp Cap(c), veh/h       | 197                                                                               | 0                                                                                 | 168  | 155                                                                               | 0                                                                                 | 132  | 416                                                                               | 1049                                                                              | 1090 | 296                                                                                 | 1015                                                                                | 1053 |
| V/C Ratio(X)                 | 0.20                                                                              | 0.00                                                                              | 0.57 | 0.22                                                                              | 0.00                                                                              | 0.39 | 0.21                                                                              | 0.55                                                                              | 0.55 | 0.07                                                                                | 0.54                                                                                | 0.54 |
| Avail Cap(c_a), veh/h        | 335                                                                               | 0                                                                                 | 286  | 328                                                                               | 0                                                                                 | 280  | 488                                                                               | 1049                                                                              | 1090 | 348                                                                                 | 1015                                                                                | 1053 |
| HCM Platoon Ratio            | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 2.00                                                                                | 2.00                                                                                | 2.00 |
| Upstream Filter(I)           | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.95                                                                                | 0.95                                                                                | 0.95 |
| Uniform Delay (d), s/veh     | 40.6                                                                              | 0.0                                                                               | 42.4 | 42.6                                                                              | 0.0                                                                               | 43.3 | 7.4                                                                               | 11.8                                                                              | 11.8 | 9.4                                                                                 | 0.0                                                                                 | 0.0  |
| Incr Delay (d2), s/veh       | 0.5                                                                               | 0.0                                                                               | 3.0  | 0.7                                                                               | 0.0                                                                               | 1.9  | 0.3                                                                               | 2.1                                                                               | 2.0  | 0.1                                                                                 | 2.0                                                                                 | 1.9  |
| Initial Q Delay(d3),s/veh    | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 0.9                                                                               | 0.0                                                                               | 2.4  | 0.8                                                                               | 0.0                                                                               | 1.3  | 0.7                                                                               | 7.7                                                                               | 8.0  | 0.2                                                                                 | 0.6                                                                                 | 0.6  |
| Unsig. Movement Delay, s/veh |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| LnGrp Delay(d),s/veh         | 41.1                                                                              | 0.0                                                                               | 45.4 | 43.3                                                                              | 0.0                                                                               | 45.2 | 7.6                                                                               | 13.9                                                                              | 13.8 | 9.5                                                                                 | 2.0                                                                                 | 1.9  |
| LnGrp LOS                    | D                                                                                 | A                                                                                 | D    | D                                                                                 | A                                                                                 | D    | A                                                                                 | B                                                                                 | B    | A                                                                                   | A                                                                                   | A    |
| Approach Vol, veh/h          | 135                                                                               |                                                                                   | 86   |                                                                                   |                                                                                   | 1273 |                                                                                   |                                                                                   | 1141 |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh        | 44.1                                                                              |                                                                                   | 44.4 |                                                                                   |                                                                                   | 13.4 |                                                                                   |                                                                                   | 2.1  |                                                                                     |                                                                                     |      |
| Approach LOS                 | D                                                                                 |                                                                                   | D    |                                                                                   |                                                                                   | B    |                                                                                   |                                                                                   | A    |                                                                                     |                                                                                     |      |
| Timer - Assigned Phs         | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6    | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s     | 65.0                                                                              |                                                                                   | 15.4 |                                                                                   | 9.1                                                                               | 62.5 | 13.1                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s      | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   | 4.5                                                                               | 4.5  | 4.5                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s  | 40.3                                                                              |                                                                                   | 18.5 |                                                                                   | 8.9                                                                               | 36.5 | 18.1                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+12), s | 21.9                                                                              |                                                                                   | 7.9  |                                                                                   | 4.1                                                                               | 2.0  | 5.2                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s      | 0.0                                                                               | 7.9                                                                               | 0.4  |                                                                                   | 0.1                                                                               | 9.3  | 0.2                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary         |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th Ctrl Delay           | 11.1                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th LOS                  | B                                                                                 |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |   |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 38                                                                                | 12                                                                                | 81                                                                                | 33                                                                                | 10                                                                                | 41                                                                                | 85                                                                                  | 1116                                                                                | 33                                                                                  | 19                                                                                  | 1052                                                                                | 35                                                                                  |
| Future Volume (veh/h)         | 38                                                                                | 12                                                                                | 81                                                                                | 33                                                                                | 10                                                                                | 41                                                                                | 85                                                                                  | 1116                                                                                | 33                                                                                  | 19                                                                                  | 1052                                                                                | 35                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.94                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                              | 0.99                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1900                                                                              | 1900                                                                              | 1663                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1737                                                                                | 1826                                                                                | 1811                                                                                | 1826                                                                                | 1841                                                                                | 1900                                                                                |
| Adj Flow Rate, veh/h          | 39                                                                                | 12                                                                                | 84                                                                                | 34                                                                                | 10                                                                                | 42                                                                                | 88                                                                                  | 1151                                                                                | 34                                                                                  | 20                                                                                  | 1085                                                                                | 36                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 0                                                                                 | 0                                                                                 | 16                                                                                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 11                                                                                  | 5                                                                                   | 6                                                                                   | 5                                                                                   | 4                                                                                   | 0                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 197                                                                               | 21                                                                                | 147                                                                               | 155                                                                               | 25                                                                                | 107                                                                               | 416                                                                                 | 2078                                                                                | 61                                                                                  | 296                                                                                 | 2002                                                                                | 66                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Prop Arrive On Green          | 0.11                                                                              | 0.11                                                                              | 0.11                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.05                                                                                | 0.60                                                                                | 0.60                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 41.1                                                                              | 0.0                                                                               | 45.4                                                                              | 43.3                                                                              | 0.0                                                                               | 45.2                                                                              | 7.6                                                                                 | 13.9                                                                                | 13.8                                                                                | 9.5                                                                                 | 2.0                                                                                 | 1.9                                                                                 |
| Ln Grp LOS                    | D                                                                                 | A                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 135                                                                               |                                                                                   |                                                                                   | 86                                                                                |                                                                                   |                                                                                   | 1273                                                                                |                                                                                     |                                                                                     | 1141                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 44.1                                                                              |                                                                                   |                                                                                   | 44.4                                                                              |                                                                                   |                                                                                   | 13.4                                                                                |                                                                                     |                                                                                     | 2.1                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.6                                                                               | 65.0                                                                              | 13.1                                                                              | 15.4                                                                              | 9.1                                                                               | 62.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.1                                                                               | 40.3                                                                              | 18.1                                                                              | 18.5                                                                              | 8.9                                                                               | 36.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.3                                                                               | 4.9                                                                               | 5.1                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.5                                                                               | 21.9                                                                              | 5.2                                                                               | 7.9                                                                               | 4.1                                                                               | 2.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 7.9                                                                               | 0.2                                                                               | 0.4                                                                               | 0.1                                                                               | 9.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.43                                                                              | 1.00                                                                              | 0.93                                                                              | 0.98                                                                              | 0.91                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.03                                                                              | 0.35                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1739                                                                              |                                                                                   | 1810                                                                              | 1810                                                                              | 1654                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 3437                                                                              | 297                                                                               | 193                                                                               |                                                                                   | 3450                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 12                                                                                | 18                                                                                | 14                                                                                |                                                                                   | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 101                                                                               | 1249                                                                              | 1354                                                                              |                                                                                   | 114                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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# HCM 6th Signalized Intersection Capacity Analysis

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|                                     |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|
| Lanes in Grp                        | 1    | 0    | 1    | 1    | 1    | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 20   | 0    | 34   | 39   | 88   | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1739 | 0    | 1810 | 1810 | 1654 | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.5  | 0.0  | 1.8  | 2.0  | 2.1  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.5  | 0.0  | 1.8  | 2.0  | 2.1  | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 462  | 0    | 1810 | 1810 | 464  | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 58.0 | 0.0  | 0.0  | 0.0  | 58.0 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 40.5 | 0.0  | 0.0  | 0.0  | 58.0 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.8  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 296  | 0    | 155  | 197  | 416  | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.07 | 0.00 | 0.22 | 0.20 | 0.21 | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 348  | 0    | 328  | 335  | 488  | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 9.4  | 0.0  | 42.6 | 40.6 | 7.4  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1  | 0.0  | 0.7  | 0.5  | 0.3  | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 9.5  | 0.0  | 43.3 | 41.1 | 7.6  | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.2  | 0.0  | 0.8  | 0.9  | 0.7  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.2  | 0.0  | 0.8  | 0.9  | 0.7  | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.04 | 0.00 | 0.27 | 0.30 | 0.13 | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Middle Lane Group Data

|                             |      |      |      |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt               | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment             | T    |      |      |      | T    |      |      |      |
| Lanes in Grp                | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h          | 0    | 581  | 0    | 0    | 0    | 550  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln  | 0    | 1735 | 0    | 0    | 0    | 1749 | 0    | 0    |
| Q Serve Time (g_s), s       | 0.0  | 19.9 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s | 0.0  | 19.9 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h     | 0    | 1049 | 0    | 0    | 0    | 1015 | 0    | 0    |
| V/C Ratio (X)               | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h      | 0    | 1049 | 0    | 0    | 0    | 1015 | 0    | 0    |
| Upstream Filter (I)         | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh   | 0.0  | 11.8 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh      | 0.0  | 2.1  | 0.0  | 0.0  | 0.0  | 2.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh    | 0.0  | 13.9 | 0.0  | 0.0  | 0.0  | 2.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln     | 0.0  | 7.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln     | 0.0  | 0.6  | 0.0  | 0.0  | 0.0  | 0.6  | 0.0  | 0.0  |

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# HCM 6th Signalized Intersection Capacity Analysis

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|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 7.7  | 0.0  | 0.0  | 0.0  | 0.6  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.46 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 604  | 52   | 96   | 0    | 571  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1804 | 1546 | 1548 | 0    | 1816 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 19.9 | 3.2  | 5.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 19.9 | 3.2  | 5.9  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.88 | 0.00 | 0.06 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1090 | 132  | 168  | 0    | 1053 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.55 | 0.39 | 0.57 | 0.00 | 0.54 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1090 | 280  | 286  | 0    | 1053 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 11.8 | 43.3 | 42.4 | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 2.0  | 1.9  | 3.0  | 0.0  | 1.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 13.8 | 45.2 | 45.4 | 0.0  | 1.9  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 7.4  | 1.2  | 2.2  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.6  | 0.1  | 0.1  | 0.0  | 0.6  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 8.0  | 1.3  | 2.4  | 0.0  | 0.6  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.48 | 0.12 | 0.28 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 11.1 |
| HCM 6th LOS        | B    |

| Intersection             |        |      |       |        |      |      |        |      |       |        |      |      |
|--------------------------|--------|------|-------|--------|------|------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 2.1    |      |       |        |      |      |        |      |       |        |      |      |
| Movement                 | EBL    | EBT  | EBR   | WBL    | WBT  | WBR  | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕    |       |        | ↕    |      |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 15     | 107  | 14    | 21     | 282  | 33   | 34     | 0    | 11    | 8      | 3    | 5    |
| Future Vol, veh/h        | 15     | 107  | 14    | 21     | 282  | 33   | 34     | 0    | 11    | 8      | 3    | 5    |
| Conflicting Peds, #/hr   | 0      | 0    | 0     | 0      | 0    | 0    | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free | Free  | Free   | Free | Free | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -    | None  | -      | -    | None | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -    | -     | -      | -    | -    | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0    | -     | -      | 0    | -    | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0    | -     | -      | 0    | -    | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92   | 92    | 92     | 92   | 92   | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 9    | 8     | 34     | 11   | 0    | 38     | 0    | 76    | 0      | 0    | 0    |
| Mvmt Flow                | 16     | 116  | 15    | 23     | 307  | 36   | 37     | 0    | 12    | 9      | 3    | 5    |
| Major/Minor              | Major1 |      |       | Major2 |      |      | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 343    | 0    | 0     | 131    | 0    | 0    | 531    | 545  | 124   | 533    | 534  | 325  |
| Stage 1                  | -      | -    | -     | -      | -    | -    | 156    | 156  | -     | 371    | 371  | -    |
| Stage 2                  | -      | -    | -     | -      | -    | -    | 375    | 389  | -     | 162    | 163  | -    |
| Critical Hdwy            | 4.1    | -    | -     | 4.44   | -    | -    | 7.48   | 6.5  | 6.96  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -    | -     | -      | -    | -    | 6.48   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -    | -     | -      | -    | -    | 6.48   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -    | -     | 2.506  | -    | -    | 3.842  | 4    | 3.984 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1227   | -    | -     | 1279   | -    | -    | 407    | 449  | 761   | 461    | 455  | 721  |
| Stage 1                  | -      | -    | -     | -      | -    | -    | 768    | 772  | -     | 653    | 623  | -    |
| Stage 2                  | -      | -    | -     | -      | -    | -    | 579    | 612  | -     | 845    | 767  | -    |
| Platoon blocked, %       | -      | -    | -     | -      | -    | -    | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1227   | -    | -     | 1279   | -    | -    | 391    | 433  | 761   | 441    | 439  | 721  |
| Mov Cap-2 Maneuver       | -      | -    | -     | -      | -    | -    | 391    | 433  | -     | 441    | 439  | -    |
| Stage 1                  | -      | -    | -     | -      | -    | -    | 757    | 761  | -     | 644    | 609  | -    |
| Stage 2                  | -      | -    | -     | -      | -    | -    | 559    | 599  | -     | 820    | 756  | -    |
| Approach                 | EB     |      |       | WB     |      |      | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.9    |      |       | 0.5    |      |      | 13.9   |      |       | 12.4   |      |      |
| HCM LOS                  |        |      |       |        |      |      | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  |      | NBLn2 | EBL    | EBT  | EBR  | WBL    | WBT  | WBR   | SBLn1  |      |      |
| Capacity (veh/h)         | 391    |      | 761   | 1227   | -    | -    | 1279   | -    | -     | 501    |      |      |
| HCM Lane V/C Ratio       | 0.095  |      | 0.016 | 0.013  | -    | -    | 0.018  | -    | -     | 0.035  |      |      |
| HCM Control Delay (s)    | 15.2   |      | 9.8   | 8      | 0    | -    | 7.9    | 0    | -     | 12.4   |      |      |
| HCM Lane LOS             | C      |      | A     | A      | A    | -    | A      | A    | -     | B      |      |      |
| HCM 95th %tile Q(veh)    | 0.3    |      | 0     | 0      | -    | -    | 0.1    | -    | -     | 0.1    |      |      |

HCM 6th TWSC  
3: Midland Ave & Deveraux Road

01/02/2025

Intersection

Int Delay, s/veh 2.1

Movement SEL SET NWT NWR SWL SWR

Lane Configurations 

Traffic Vol, veh/h 34 691 1186 31 30 54

Future Vol, veh/h 34 691 1186 31 30 54

Conflicting Peds, #/hr 2 0 0 2 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length 100 - - - 0 -

Veh in Median Storage, # - 0 0 - 1 -

Grade, % - 0 0 - 0 -

Peak Hour Factor 91 91 91 91 91 91

Heavy Vehicles, % 2 2 2 2 2 2

Mvmt Flow 37 759 1303 34 33 59

Major/Minor Major1 Major2 Minor2

Conflicting Flow All 1339 0 - 0 2155 1322

Stage 1 - - - - 1322 -

Stage 2 - - - - 833 -

Critical Hdwy 4.12 - - - 6.42 6.22

Critical Hdwy Stg 1 - - - - 5.42 -

Critical Hdwy Stg 2 - - - - 5.42 -

Follow-up Hdwy 2.218 - - - 3.518 3.318

Pot Cap-1 Maneuver 515 - - - 53 191

Stage 1 - - - - 249 -

Stage 2 - - - - 427 -

Platoon blocked, % - - - -

Mov Cap-1 Maneuver 514 - - - 49 191

Mov Cap-2 Maneuver - - - - 157 -

Stage 1 - - - - 231 -

Stage 2 - - - - 426 -

Approach SE NW SW

HCM Control Delay, s 0.6 0 45.6

HCM LOS E

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h) - - 514 - 177

HCM Lane V/C Ratio - - 0.073 - 0.522

HCM Control Delay (s) - - 12.6 - 45.6

HCM Lane LOS - - B - E

HCM 95th %tile Q(veh) - - 0.2 - 2.6

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

12/31/2024

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 74.5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 37                                                                                | 463                                                                               | 155                                                                               | 7                                                                                 | 914                                                                               | 43   | 222  | 1                                                                                 | 5    | 44   | 2                                                                                   | 59                                                                                  |
| Future Vol, veh/h        | 37                                                                                | 463                                                                               | 155                                                                               | 7                                                                                 | 914                                                                               | 43   | 222  | 1                                                                                 | 5    | 44   | 2                                                                                   | 59                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 0                                                                                 | 2                                                                                 | 7                                                                                 | 11                                                                                | 1                                                                                 | 0    | 8    | 0                                                                                 | 34   | 0    | 0                                                                                   | 0                                                                                   |
| Mvmt Flow                | 42                                                                                | 520                                                                               | 174                                                                               | 8                                                                                 | 1027                                                                              | 48   | 249  | 1                                                                                 | 6    | 49   | 2                                                                                   | 66                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |      |       | Minor2 |      |      |
|----------------------|--------|---|---|--------|---|---|--------|------|-------|--------|------|------|
| Conflicting Flow All | 1075   | 0 | 0 | 696    | 0 | 0 | 1708   | 1697 | 522   | 1762   | 1847 | 1052 |
| Stage 1              | -      | - | - | -      | - | - | 606    | 606  | -     | 1067   | 1067 | -    |
| Stage 2              | -      | - | - | -      | - | - | 1102   | 1091 | -     | 695    | 780  | -    |
| Critical Hdwy        | 4.1    | - | - | 4.21   | - | - | 7.18   | 6.5  | 6.54  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.18   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.18   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy       | 2.2    | - | - | 2.299  | - | - | 3.572  | 4    | 3.606 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver   | 656    | - | - | 859    | - | - | ~ 69   | 93   | 497   | 67     | 75   | 278  |
| Stage 1              | -      | - | - | -      | - | - | 474    | 490  | -     | 271    | 301  | -    |
| Stage 2              | -      | - | - | -      | - | - | 250    | 293  | -     | 436    | 409  | -    |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver   | 656    | - | - | 857    | - | - | ~ 49   | 86   | 496   | 62     | 69   | 278  |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | ~ 115  | 182  | -     | 168    | 182  | -    |
| Stage 1              | -      | - | - | -      | - | - | 443    | 458  | -     | 254    | 298  | -    |
| Stage 2              | -      | - | - | -      | - | - | ~ 187  | 290  | -     | 402    | 382  | -    |

| Approach             | EB  |  |  | WB  |  |  | NB       |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|----------|--|--|------|--|--|
| HCM Control Delay, s | 0.6 |  |  | 0.1 |  |  | \$ 622.7 |  |  | 27.9 |  |  |
| HCM LOS              |     |  |  |     |  |  | F        |  |  | D    |  |  |

| Minor Lane/Major Mvmt | NBLn1    | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|----------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 117      | 656   | -   | -   | 857   | -   | -   | 169   | 278   |
| HCM Lane V/C Ratio    | 2.19     | 0.063 | -   | -   | 0.009 | -   | -   | 0.306 | 0.238 |
| HCM Control Delay (s) | \$ 622.7 | 10.9  | -   | -   | 9.2   | -   | -   | 35.4  | 22    |
| HCM Lane LOS          | F        | B     | -   | -   | A     | -   | -   | E     | C     |
| HCM 95th %tile Q(veh) | 21.8     | 0.2   | -   | -   | 0     | -   | -   | 1.2   | 0.9   |

| Notes                      |  |                        |  |                            |  |                                |  |  |  |  |  |  |
|----------------------------|--|------------------------|--|----------------------------|--|--------------------------------|--|--|--|--|--|--|
| ~: Volume exceeds capacity |  | \$: Delay exceeds 300s |  | +: Computation Not Defined |  | *: All major volume in platoon |  |  |  |  |  |  |



Intersection

Intersection Delay, s/veh 25.6

Intersection LOS D

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 34   | 359  | 74   | 27   | 372  | 69   | 57   | 10   | 31   | 38   | 20   | 24   |
| Future Vol, veh/h   | 34   | 359  | 74   | 27   | 372  | 69   | 57   | 10   | 31   | 38   | 20   | 24   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 3    | 15   | 0    | 3    | 0    | 23   | 11   | 0    | 2    | 0    | 7    |
| Mvmt Flow           | 40   | 417  | 86   | 31   | 433  | 80   | 66   | 12   | 36   | 44   | 23   | 28   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB | NB   | SB   |
|----------------------------|------|----|------|------|
| Opposing Approach          | WB   | EB | SB   | NB   |
| Opposing Lanes             | 1    | 1  | 1    | 1    |
| Conflicting Approach Left  | SB   | NB | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1  | 1    | 1    |
| Conflicting Approach Right | NB   | SB | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1  | 1    | 1    |
| HCM Control Delay          | 28.3 | 28 | 12.6 | 11.7 |
| HCM LOS                    | D    | D  | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 58%   | 7%    | 6%    | 46%   |
| Vol Thru, %            | 10%   | 77%   | 79%   | 24%   |
| Vol Right, %           | 32%   | 16%   | 15%   | 29%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 98    | 467   | 468   | 82    |
| LT Vol                 | 57    | 34    | 27    | 38    |
| Through Vol            | 10    | 359   | 372   | 20    |
| RT Vol                 | 31    | 74    | 69    | 24    |
| Lane Flow Rate         | 114   | 543   | 544   | 95    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.233 | 0.817 | 0.815 | 0.188 |
| Departure Headway (Hd) | 7.368 | 5.417 | 5.39  | 7.091 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 490   | 662   | 664   | 509   |
| Service Time           | 5.376 | 3.51  | 3.481 | 5.097 |
| HCM Lane V/C Ratio     | 0.233 | 0.82  | 0.819 | 0.187 |
| HCM Control Delay      | 12.6  | 28.3  | 28    | 11.7  |
| HCM Lane LOS           | B     | D     | D     | B     |
| HCM 95th-tile Q        | 0.9   | 8.5   | 8.5   | 0.7   |

Intersection

Intersection Delay, s/veh 8.3

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 14   | 68   | 17   | 19   | 49   | 54   | 0    | 0    | 0    | 64   | 41   | 18   |
| Future Vol, veh/h   | 14   | 68   | 17   | 19   | 49   | 54   | 0    | 0    | 0    | 64   | 41   | 18   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 0    | 2    | 0    | 0    | 2    | 27   | 0    | 0    | 0    | 14   | 0    | 6    |
| Mvmt Flow           | 16   | 79   | 20   | 22   | 57   | 63   | 0    | 0    | 0    | 74   | 48   | 21   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB | WB | NB | SB  |
|----------------------------|----|----|----|-----|
| Opposing Approach          | WB | EB | SB | NB  |
| Opposing Lanes             | 1  | 1  | 1  | 1   |
| Conflicting Approach Left  | SB | NB | EB | WB  |
| Conflicting Lanes Left     | 1  | 1  | 1  | 1   |
| Conflicting Approach Right | NB | SB | WB | EB  |
| Conflicting Lanes Right    | 1  | 1  | 1  | 1   |
| HCM Control Delay          | 8  | 8  | 0  | 8.8 |
| HCM LOS                    | A  | A  | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 16%   | 52%   |
| Vol Thru, %            | 100%  | 69%   | 40%   | 33%   |
| Vol Right, %           | 0%    | 17%   | 44%   | 15%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 99    | 122   | 123   |
| LT Vol                 | 0     | 14    | 19    | 64    |
| Through Vol            | 0     | 68    | 49    | 41    |
| RT Vol                 | 0     | 17    | 54    | 18    |
| Lane Flow Rate         | 0     | 115   | 142   | 143   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.138 | 0.163 | 0.187 |
| Departure Headway (Hd) | 4.636 | 4.328 | 4.145 | 4.711 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 831   | 868   | 764   |
| Service Time           | 2.659 | 2.342 | 2.159 | 2.728 |
| HCM Lane V/C Ratio     | 0     | 0.138 | 0.164 | 0.187 |
| HCM Control Delay      | 7.7   | 8     | 8     | 8.8   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.5   | 0.6   | 0.7   |

# HCM 6th Signalized Intersection Summary

## 16: 9th Street & SH-82

12/31/2024



| Movement                      | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR   | NBL                                                                               | NBT                                                                               | NBR  | SBL                                                                                 | SBT                                                                                 | SBR  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations           |  |  |      |  |  |       |  |  |      |  |  |      |
| Traffic Volume (veh/h)        | 51                                                                                | 13                                                                                | 62   | 34                                                                                | 17                                                                                | 98    | 57                                                                                | 1943                                                                              | 16   | 25                                                                                  | 967                                                                                 | 25   |
| Future Volume (veh/h)         | 51                                                                                | 13                                                                                | 62   | 34                                                                                | 17                                                                                | 98    | 57                                                                                | 1943                                                                              | 16   | 25                                                                                  | 967                                                                                 | 25   |
| Initial Q (Qb), veh           | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                 | 0                                                                                 | 0     | 0                                                                                 | 0                                                                                 | 0    | 0                                                                                   | 0                                                                                   | 0    |
| Ped-Bike Adj(A_pbT)           | 1.00                                                                              |                                                                                   | 0.91 | 1.00                                                                              |                                                                                   | 0.93  | 1.00                                                                              |                                                                                   | 0.97 | 1.00                                                                                |                                                                                     | 0.97 |
| Parking Bus, Adj              | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Work Zone On Approach         | No                                                                                |                                                                                   |      | No                                                                                |                                                                                   |       | No                                                                                |                                                                                   |      | No                                                                                  |                                                                                     |      |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1900                                                                              | 1693 | 1856                                                                              | 1900                                                                              | 1900  | 1618                                                                              | 1900                                                                              | 1870 | 1900                                                                                | 1870                                                                                | 1781 |
| Adj Flow Rate, veh/h          | 53                                                                                | 13                                                                                | 64   | 35                                                                                | 18                                                                                | 101   | 59                                                                                | 2003                                                                              | 16   | 26                                                                                  | 997                                                                                 | 26   |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                              | 0.97                                                                              | 0.97  | 0.97                                                                              | 0.97                                                                              | 0.97 | 0.97                                                                                | 0.97                                                                                | 0.97 |
| Percent Heavy Veh, %          | 2                                                                                 | 0                                                                                 | 14   | 3                                                                                 | 0                                                                                 | 0     | 19                                                                                | 0                                                                                 | 2    | 0                                                                                   | 2                                                                                   | 8    |
| Cap, veh/h                    | 144                                                                               | 21                                                                                | 103  | 170                                                                               | 22                                                                                | 126   | 356                                                                               | 2556                                                                              | 20   | 151                                                                                 | 2439                                                                                | 64   |
| Arrive On Green               | 0.08                                                                              | 0.08                                                                              | 0.08 | 0.10                                                                              | 0.10                                                                              | 0.10  | 0.03                                                                              | 0.70                                                                              | 0.70 | 0.02                                                                                | 0.69                                                                                | 0.69 |
| Sat Flow, veh/h               | 1781                                                                              | 258                                                                               | 1272 | 1767                                                                              | 234                                                                               | 1311  | 1541                                                                              | 3670                                                                              | 29   | 1810                                                                                | 3535                                                                                | 92   |
| Grp Volume(v), veh/h          | 53                                                                                | 0                                                                                 | 77   | 35                                                                                | 0                                                                                 | 119   | 59                                                                                | 984                                                                               | 1035 | 26                                                                                  | 501                                                                                 | 522  |
| Grp Sat Flow(s),veh/h/ln      | 1781                                                                              | 0                                                                                 | 1531 | 1767                                                                              | 0                                                                                 | 1544  | 1541                                                                              | 1805                                                                              | 1894 | 1810                                                                                | 1777                                                                                | 1851 |
| Q Serve(g_s), s               | 4.8                                                                               | 0.0                                                                               | 8.3  | 3.1                                                                               | 0.0                                                                               | 12.8  | 1.9                                                                               | 61.7                                                                              | 62.2 | 0.7                                                                                 | 20.7                                                                                | 20.7 |
| Cycle Q Clear(g_c), s         | 4.8                                                                               | 0.0                                                                               | 8.3  | 3.1                                                                               | 0.0                                                                               | 12.8  | 1.9                                                                               | 61.7                                                                              | 62.2 | 0.7                                                                                 | 20.7                                                                                | 20.7 |
| Prop In Lane                  | 1.00                                                                              |                                                                                   | 0.83 | 1.00                                                                              |                                                                                   | 0.85  | 1.00                                                                              |                                                                                   | 0.02 | 1.00                                                                                |                                                                                     | 0.05 |
| Lane Grp Cap(c), veh/h        | 144                                                                               | 0                                                                                 | 124  | 170                                                                               | 0                                                                                 | 148   | 356                                                                               | 1257                                                                              | 1319 | 151                                                                                 | 1226                                                                                | 1277 |
| V/C Ratio(X)                  | 0.37                                                                              | 0.00                                                                              | 0.62 | 0.21                                                                              | 0.00                                                                              | 0.80  | 0.17                                                                              | 0.78                                                                              | 0.78 | 0.17                                                                                | 0.41                                                                                | 0.41 |
| Avail Cap(c_a), veh/h         | 194                                                                               | 0                                                                                 | 167  | 194                                                                               | 0                                                                                 | 170   | 365                                                                               | 1257                                                                              | 1319 | 183                                                                                 | 1226                                                                                | 1277 |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                              | 1.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 1.00                                                                                | 1.00                                                                                | 1.00 |
| Upstream Filter(I)            | 1.00                                                                              | 0.00                                                                              | 1.00 | 1.00                                                                              | 0.00                                                                              | 1.00  | 1.00                                                                              | 1.00                                                                              | 1.00 | 0.95                                                                                | 0.95                                                                                | 0.95 |
| Uniform Delay (d), s/veh      | 74.0                                                                              | 0.0                                                                               | 75.6 | 70.9                                                                              | 0.0                                                                               | 75.3  | 8.5                                                                               | 17.2                                                                              | 17.3 | 19.7                                                                                | 11.4                                                                                | 11.4 |
| Incr Delay (d2), s/veh        | 1.6                                                                               | 0.0                                                                               | 5.1  | 0.6                                                                               | 0.0                                                                               | 21.2  | 0.2                                                                               | 4.9                                                                               | 4.7  | 0.5                                                                                 | 1.0                                                                                 | 0.9  |
| Initial Q Delay(d3),s/veh     | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                               | 0.0                                                                               | 0.0   | 0.0                                                                               | 0.0                                                                               | 0.0  | 0.0                                                                                 | 0.0                                                                                 | 0.0  |
| %ile BackOfQ(50%),veh/ln      | 2.3                                                                               | 0.0                                                                               | 3.5  | 1.4                                                                               | 0.0                                                                               | 6.0   | 0.7                                                                               | 26.4                                                                              | 27.9 | 0.4                                                                                 | 8.5                                                                                 | 8.9  |
| Unsig. Movement Delay, s/veh  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| LnGrp Delay(d),s/veh          | 75.6                                                                              | 0.0                                                                               | 80.7 | 71.5                                                                              | 0.0                                                                               | 96.5  | 8.7                                                                               | 22.1                                                                              | 22.0 | 20.2                                                                                | 12.3                                                                                | 12.3 |
| LnGrp LOS                     | E                                                                                 | A                                                                                 | F    | E                                                                                 | A                                                                                 | F     | A                                                                                 | C                                                                                 | C    | C                                                                                   | B                                                                                   | B    |
| Approach Vol, veh/h           | 130                                                                               |                                                                                   | 154  |                                                                                   |                                                                                   | 2078  |                                                                                   |                                                                                   | 1049 |                                                                                     |                                                                                     |      |
| Approach Delay, s/veh         | 78.6                                                                              |                                                                                   | 90.8 |                                                                                   |                                                                                   | 21.7  |                                                                                   |                                                                                   | 12.5 |                                                                                     |                                                                                     |      |
| Approach LOS                  | E                                                                                 |                                                                                   | F    |                                                                                   |                                                                                   | C     |                                                                                   |                                                                                   | B    |                                                                                     |                                                                                     |      |
| Timer - Assigned Phs          | 1                                                                                 | 2                                                                                 | 4    |                                                                                   | 5                                                                                 | 6     | 8                                                                                 |                                                                                   |      |                                                                                     |                                                                                     |      |
| Phs Duration (G+Y+Rc), s      | 8.0                                                                               | 122.9                                                                             | 18.2 |                                                                                   | 9.2                                                                               | 121.8 | 20.8                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5  |                                                                                   | 4.5                                                                               | 4.5   | 4.5                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Green Setting (Gmax), s   | 6.5                                                                               | 108.3                                                                             | 18.5 |                                                                                   | 5.7                                                                               | 109.1 | 18.7                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Max Q Clear Time (g_c+1/2), s | 12.7                                                                              | 64.2                                                                              | 10.3 |                                                                                   | 3.9                                                                               | 22.7  | 14.8                                                                              |                                                                                   |      |                                                                                     |                                                                                     |      |
| Green Ext Time (p_c), s       | 0.0                                                                               | 27.3                                                                              | 0.3  |                                                                                   | 0.0                                                                               | 8.7   | 0.2                                                                               |                                                                                   |      |                                                                                     |                                                                                     |      |
| Intersection Summary          |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th Ctrl Delay            |                                                                                   |                                                                                   | 24.1 |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |
| HCM 6th LOS                   |                                                                                   |                                                                                   | C    |                                                                                   |                                                                                   |       |                                                                                   |                                                                                   |      |                                                                                     |                                                                                     |      |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 51                                                                                | 13                                                                                | 62                                                                                | 34                                                                                | 17                                                                                | 98                                                                                | 57                                                                                  | 1943                                                                                | 16                                                                                  | 25                                                                                  | 967                                                                                 | 25                                                                                  |
| Future Volume (veh/h)         | 51                                                                                | 13                                                                                | 62                                                                                | 34                                                                                | 17                                                                                | 98                                                                                | 57                                                                                  | 1943                                                                                | 16                                                                                  | 25                                                                                  | 967                                                                                 | 25                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.91                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1900                                                                              | 1693                                                                              | 1856                                                                              | 1900                                                                              | 1900                                                                              | 1618                                                                                | 1900                                                                                | 1870                                                                                | 1900                                                                                | 1870                                                                                | 1781                                                                                |
| Adj Flow Rate, veh/h          | 53                                                                                | 13                                                                                | 64                                                                                | 35                                                                                | 18                                                                                | 101                                                                               | 59                                                                                  | 2003                                                                                | 16                                                                                  | 26                                                                                  | 997                                                                                 | 26                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 0                                                                                 | 14                                                                                | 3                                                                                 | 0                                                                                 | 0                                                                                 | 19                                                                                  | 0                                                                                   | 2                                                                                   | 0                                                                                   | 2                                                                                   | 8                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 144                                                                               | 21                                                                                | 103                                                                               | 170                                                                               | 22                                                                                | 126                                                                               | 356                                                                                 | 2556                                                                                | 20                                                                                  | 151                                                                                 | 2439                                                                                | 64                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.03                                                                                | 0.70                                                                                | 0.70                                                                                | 0.02                                                                                | 0.69                                                                                | 0.69                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 75.6                                                                              | 0.0                                                                               | 80.7                                                                              | 71.5                                                                              | 0.0                                                                               | 96.5                                                                              | 8.7                                                                                 | 22.1                                                                                | 22.0                                                                                | 20.2                                                                                | 12.3                                                                                | 12.3                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | C                                                                                   | C                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 130                                                                               |                                                                                   |                                                                                   | 154                                                                               |                                                                                   |                                                                                   | 2078                                                                                |                                                                                     |                                                                                     | 1049                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.6                                                                              |                                                                                   |                                                                                   | 90.8                                                                              |                                                                                   |                                                                                   | 21.7                                                                                |                                                                                     |                                                                                     | 12.5                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 8.0                                                                               |                                                                                   | 122.9                                                                             | 20.8                                                                              | 18.2                                                                              | 9.2                                                                               | 121.8                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              | 18.5                                                                              | 5.7                                                                               | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.2                                                                               | 5.3                                                                               | 4.9                                                                               | 3.9                                                                               | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.7                                                                               |                                                                                   | 64.2                                                                              | 14.8                                                                              | 10.3                                                                              | 3.9                                                                               | 22.7                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 27.3                                                                              | 0.2                                                                               | 0.3                                                                               | 0.0                                                                               | 8.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.71                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.94                                                                              | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              | 0.10                                                                              | 1.00                                                                              | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1810                                                                              |                                                                                   | 1767                                                                              |                                                                                   | 1781                                                                              | 1541                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3670                                                                              |                                                                                   | 234                                                                               |                                                                                   | 258                                                                               | 3535                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 29                                                                                |                                                                                   | 1311                                                                              |                                                                                   | 1272                                                                              | 92                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

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|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 26    | 0    | 35   | 53   | 59    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1810  | 0    | 1767 | 1781 | 1541  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.7   | 0.0  | 3.1  | 4.8  | 1.9   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.7   | 0.0  | 3.1  | 4.8  | 1.9   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 215   | 0    | 1767 | 1781 | 477   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 117.3 | 0.0  | 0.0  | 0.0  | 117.3 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 56.2  | 0.0  | 0.0  | 0.0  | 96.6  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 8.4   | 0.0  | 0.0  | 0.0  | 2.9   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 151   | 0    | 170  | 144  | 356   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.17  | 0.00 | 0.21 | 0.37 | 0.17  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 183   | 0    | 194  | 194  | 365   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 19.7  | 0.0  | 70.9 | 74.0 | 8.5   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.5   | 0.0  | 0.6  | 1.6  | 0.2   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 20.2  | 0.0  | 71.5 | 75.6 | 8.7   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.4   | 0.0  | 1.4  | 2.2  | 0.6   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.4   | 0.0  | 1.4  | 2.3  | 0.7   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.09  | 0.00 | 0.49 | 0.77 | 0.13  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      |      | T     |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 984  | 0    | 0    | 0     | 501  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1805 | 0    | 0    | 0     | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 61.7 | 0.0  | 0.0  | 0.0   | 20.7 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 61.7 | 0.0  | 0.0  | 0.0   | 20.7 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1257 | 0    | 0    | 0     | 1226 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.78 | 0.00 | 0.00 | 0.00  | 0.41 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1257 | 0    | 0    | 0     | 1226 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 17.2 | 0.0  | 0.0  | 0.0   | 11.4 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 4.9  | 0.0  | 0.0  | 0.0   | 1.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 22.1 | 0.0  | 0.0  | 0.0   | 12.3 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 24.7 | 0.0  | 0.0  | 0.0   | 8.2  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 1.7  | 0.0  | 0.0  | 0.0   | 0.3  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

12/31/2024

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 26.4 | 0.0  | 0.0  | 0.0  | 8.5  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.53 | 0.00 | 0.00 | 0.00 | 0.53 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 1035 | 119  | 77   | 0    | 522  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1894 | 1544 | 1531 | 0    | 1851 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 62.2 | 12.8 | 8.3  | 0.0  | 20.7 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 62.2 | 12.8 | 8.3  | 0.0  | 20.7 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.83 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1319 | 148  | 124  | 0    | 1277 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.78 | 0.80 | 0.62 | 0.00 | 0.41 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1319 | 170  | 167  | 0    | 1277 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 17.3 | 75.3 | 75.6 | 0.0  | 11.4 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 4.7  | 21.2 | 5.1  | 0.0  | 0.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 22.0 | 96.5 | 80.7 | 0.0  | 12.3 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 26.1 | 5.1  | 3.3  | 0.0  | 8.6  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.7  | 0.9  | 0.2  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 27.9 | 6.0  | 3.5  | 0.0  | 8.9  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.61 | 0.54 | 0.41 | 0.00 | 0.55 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 24.1 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |      |       |        |      |      |
|--------------------------|--------|-------|-------|--------|------|-------|--------|------|-------|--------|------|------|
| Int Delay, s/veh         | 2.6    |       |       |        |      |       |        |      |       |        |      |      |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT  | NBR   | SBL    | SBT  | SBR  |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕    | ↕     |        | ↕    |      |
| Traffic Vol, veh/h       | 4      | 145   | 9     | 6      | 185  | 2     | 37     | 3    | 12    | 18     | 3    | 18   |
| Future Vol, veh/h        | 4      | 145   | 9     | 6      | 185  | 2     | 37     | 3    | 12    | 18     | 3    | 18   |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0    | 0     | 0      | 0    | 0    |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop | Stop  | Stop   | Stop | Stop |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -    | None  | -      | -    | None |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -    | 0     | -      | -    | -    |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0    | -     | -      | 0    | -    |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92   | 92    | 92     | 92   | 92   |
| Heavy Vehicles, %        | 0      | 21    | 4     | 69     | 10   | 0     | 17     | 0    | 33    | 0      | 0    | 0    |
| Mvmt Flow                | 4      | 158   | 10    | 7      | 201  | 2     | 40     | 3    | 13    | 20     | 3    | 20   |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |      |       | Minor2 |      |      |
| Conflicting Flow All     | 203    | 0     | 0     | 168    | 0    | 0     | 399    | 388  | 163   | 395    | 392  | 202  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 171    | 171  | -     | 216    | 216  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 228    | 217  | -     | 179    | 176  | -    |
| Critical Hdwy            | 4.1    | -     | -     | 4.79   | -    | -     | 7.27   | 6.5  | 6.53  | 7.1    | 6.5  | 6.2  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.27   | 5.5  | -     | 6.1    | 5.5  | -    |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.27   | 5.5  | -     | 6.1    | 5.5  | -    |
| Follow-up Hdwy           | 2.2    | -     | -     | 2.821  | -    | -     | 3.653  | 4    | 3.597 | 3.5    | 4    | 3.3  |
| Pot Cap-1 Maneuver       | 1381   | -     | -     | 1089   | -    | -     | 535    | 550  | 807   | 568    | 547  | 844  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 797    | 761  | -     | 791    | 728  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 742    | 727  | -     | 827    | 757  | -    |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -    | -     | -      | -    | -    |
| Mov Cap-1 Maneuver       | 1381   | -     | -     | 1089   | -    | -     | 516    | 545  | 807   | 552    | 542  | 844  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 516    | 545  | -     | 552    | 542  | -    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 795    | 759  | -     | 789    | 723  | -    |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 716    | 722  | -     | 808    | 755  | -    |
| Approach                 | EB     |       |       | WB     |      |       | NB     |      |       | SB     |      |      |
| HCM Control Delay, s     | 0.2    |       |       | 0.3    |      |       | 11.9   |      |       | 10.9   |      |      |
| HCM LOS                  |        |       |       |        |      |       | B      |      |       | B      |      |      |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR  | SBLn1 |        |      |      |
| Capacity (veh/h)         | 518    | 807   | 1381  | -      | -    | 1089  | -      | -    | 656   |        |      |      |
| HCM Lane V/C Ratio       | 0.084  | 0.016 | 0.003 | -      | -    | 0.006 | -      | -    | 0.065 |        |      |      |
| HCM Control Delay (s)    | 12.6   | 9.5   | 7.6   | 0      | -    | 8.3   | 0      | -    | 10.9  |        |      |      |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -    | B     |        |      |      |
| HCM 95th %tile Q(veh)    | 0.3    | 0     | 0     | -      | -    | 0     | -      | -    | 0.2   |        |      |      |



Intersection: 3: Midland Ave & Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 43  | 2   | 80  |
| Average Queue (ft)    | 14  | 0   | 24  |
| 95th Queue (ft)       | 42  | 2   | 57  |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | LTR | LT  | R  |
| Maximum Queue (ft)    | 34  | 6   | 36 | 9   | 116 | 70  | 31 |
| Average Queue (ft)    | 7   | 0   | 5  | 0   | 38  | 15  | 5  |
| 95th Queue (ft)       | 28  | 5   | 25 | 5   | 91  | 52  | 24 |
| Link Distance (ft)    |     | 776 |    |     | 824 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |     |     |    |
| Queuing Penalty (veh) |     |     |    |     |     |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     |     | 0   |    |
| Queuing Penalty (veh) |     | 0   | 1  |     |     | 0   |    |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 127 | 166 | 64  | 58  |
| Average Queue (ft)    | 57  | 86  | 32  | 30  |
| 95th Queue (ft)       | 100 | 144 | 56  | 53  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) |     | 0   |     |     |
| Queuing Penalty (veh) |     | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 67  | 82  | 27  | 104 |
| Average Queue (ft)    | 32  | 40  | 2   | 50  |
| 95th Queue (ft)       | 56  | 68  | 13  | 81  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 73 | 101 | 73 | 74  | 168 | 353 | 268 | 78  | 246 | 241 |
| Average Queue (ft)    | 28 | 39  | 26 | 28  | 49  | 159 | 122 | 14  | 97  | 94  |
| 95th Queue (ft)       | 63 | 77  | 60 | 60  | 122 | 300 | 240 | 49  | 193 | 192 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    |     |    |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |    |     |    |     |     | 0   |     |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 1  | 2   | 1  | 0   | 0   | 8   |     |     | 3   |     |
| Queuing Penalty (veh) | 1  | 1   | 0  | 0   | 0   | 6   |     |     | 1   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 14  | 8    | 64  | 65  | 30  |
| Average Queue (ft)    | 1   | 0    | 20  | 9   | 9   |
| 95th Queue (ft)       | 7   | 6    | 55  | 42  | 32  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 9

## Intersection: 3: Midland Ave &amp; Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 54  | 8   | 99  |
| Average Queue (ft)    | 16  | 0   | 40  |
| 95th Queue (ft)       | 45  | 5   | 75  |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 27  | 12  | 42 | 25  | 41   | 94  | 41  | 47 |
| Average Queue (ft)    | 3   | 0   | 7  | 2   | 2    | 37  | 13  | 20 |
| 95th Queue (ft)       | 17  | 8   | 29 | 15  | 20   | 76  | 39  | 46 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      |     |     |    |
| Queuing Penalty (veh) |     |     |    |     |      |     |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     |      |     |     |    |
| Queuing Penalty (veh) |     | 0   | 1  |     |      |     |     |    |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 172 | 111 | 82  | 66  |
| Average Queue (ft)    | 64  | 55  | 38  | 33  |
| 95th Queue (ft)       | 127 | 89  | 67  | 55  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 0   |     |     |     |
| Queuing Penalty (veh) | 1   |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 58  | 73  | 72  |
| Average Queue (ft)    | 32  | 39  | 35  |
| 95th Queue (ft)       | 51  | 66  | 57  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 93 | 150 | 98 | 192 | 174 | 469 | 468 | 119 | 304 | 295 |
| Average Queue (ft)    | 43 | 46  | 36 | 84  | 42  | 354 | 315 | 24  | 107 | 100 |
| 95th Queue (ft)       | 88 | 108 | 85 | 158 | 134 | 545 | 532 | 77  | 234 | 222 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |    |     |     | 14  | 10  |     |     |     |
| Queuing Penalty (veh) |    | 0   |    |     |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 9  | 6   | 4  | 23  | 0   | 28  |     | 0   | 6   |     |
| Queuing Penalty (veh) | 6  | 3   | 4  | 7   | 0   | 12  |     | 0   | 1   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | NB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | R   | LTR |
| Maximum Queue (ft)    | 6   | 53  | 31  | 37  |
| Average Queue (ft)    | 0   | 17  | 4   | 16  |
| 95th Queue (ft)       | 4   | 47  | 22  | 41  |
| Link Distance (ft)    | 824 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 34

## Intersection: 3: Midland Ave &amp; Deveraux Road

| Movement              | SE  | SW  |
|-----------------------|-----|-----|
| Directions Served     | L   | LR  |
| Maximum Queue (ft)    | 48  | 66  |
| Average Queue (ft)    | 18  | 25  |
| 95th Queue (ft)       | 45  | 54  |
| Link Distance (ft)    |     | 774 |
| Upstream Blk Time (%) |     |     |
| Queuing Penalty (veh) |     |     |
| Storage Bay Dist (ft) | 100 |     |
| Storage Blk Time (%)  |     |     |
| Queuing Penalty (veh) |     |     |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB   | SB  | SB |
|-----------------------|-----|-----|----|-----|------|------|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR  | LT  | R  |
| Maximum Queue (ft)    | 38  | 22  | 50 | 28  | 15   | 840  | 86  | 62 |
| Average Queue (ft)    | 12  | 1   | 15 | 1   | 0    | 780  | 21  | 13 |
| 95th Queue (ft)       | 35  | 9   | 44 | 12  | 8    | 1009 | 65  | 43 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824  | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 58   |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 173  |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |      |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     |      |      | 2   | 0  |
| Queuing Penalty (veh) |     | 0   | 3  |     |      |      | 0   | 0  |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 194 | 187 | 71  | 56  |
| Average Queue (ft)    | 113 | 109 | 35  | 31  |
| 95th Queue (ft)       | 179 | 171 | 61  | 51  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 0   | 0   |     |     |
| Queuing Penalty (veh) | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 76  | 83  | 31  | 87  |
| Average Queue (ft)    | 34  | 42  | 2   | 49  |
| 95th Queue (ft)       | 59  | 71  | 16  | 76  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 79 | 97  | 73 | 65  | 174 | 365 | 315 | 55  | 269 | 254 |
| Average Queue (ft)    | 29 | 42  | 25 | 26  | 55  | 163 | 130 | 14  | 118 | 111 |
| 95th Queue (ft)       | 65 | 77  | 61 | 57  | 127 | 305 | 258 | 44  | 230 | 218 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    |     |    |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |    |     |    |     |     | 0   |     |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 1  | 2   | 1  | 0   | 0   | 8   |     |     | 6   |     |
| Queuing Penalty (veh) | 1  | 1   | 1  | 0   | 0   | 6   |     |     | 1   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 23  | 1551 | 218 | 115 | 46  |
| Average Queue (ft)    | 1   | 880  | 86  | 21  | 13  |
| 95th Queue (ft)       | 9   | 1901 | 265 | 134 | 38  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 30   | 11  | 4   |     |
| Queuing Penalty (veh) |     | 0    | 0   | 0   |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 186

## Intersection: 3: Midland Ave &amp; Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 54  | 4   | 132 |
| Average Queue (ft)    | 20  | 0   | 49  |
| 95th Queue (ft)       | 49  | 3   | 100 |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB | WB  | WB   | NB   | SB  | SB |
|-----------------------|-----|----|-----|------|------|-----|----|
| Directions Served     | L   | R  | L   | TR   | LTR  | LT  | R  |
| Maximum Queue (ft)    | 50  | 45 | 25  | 11   | 839  | 92  | 82 |
| Average Queue (ft)    | 16  | 15 | 3   | 0    | 654  | 34  | 36 |
| 95th Queue (ft)       | 42  | 43 | 17  | 7    | 1012 | 70  | 68 |
| Link Distance (ft)    |     |    |     | 3357 | 824  | 327 |    |
| Upstream Blk Time (%) |     |    |     |      | 36   |     |    |
| Queuing Penalty (veh) |     |    |     |      | 73   |     |    |
| Storage Bay Dist (ft) | 100 | 25 | 150 |      |      |     | 75 |
| Storage Blk Time (%)  |     | 0  |     |      |      | 2   | 2  |
| Queuing Penalty (veh) |     | 1  |     |      |      | 1   | 1  |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 184 | 191 | 79  | 66  |
| Average Queue (ft)    | 101 | 105 | 38  | 33  |
| 95th Queue (ft)       | 164 | 169 | 67  | 58  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 0   | 0   |     |     |
| Queuing Penalty (veh) | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |



Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 65  | 77  | 71  |
| Average Queue (ft)    | 33  | 40  | 36  |
| 95th Queue (ft)       | 53  | 65  | 57  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 98 | 157 | 100 | 192 | 162 | 464 | 460 | 112 | 304 | 300 |
| Average Queue (ft)    | 44 | 48  | 38  | 80  | 38  | 354 | 303 | 27  | 138 | 134 |
| 95th Queue (ft)       | 91 | 111 | 91  | 155 | 116 | 548 | 512 | 76  | 272 | 269 |
| Link Distance (ft)    |    | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |     | 0   |     | 8   | 4   |     |     |     |
| Queuing Penalty (veh) |    | 0   |     | 0   |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 9  | 6   | 5   | 21  | 0   | 20  |     | 0   | 8   |     |
| Queuing Penalty (veh) | 6  | 3   | 5   | 6   | 0   | 9   |     | 0   | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 5   | 854  | 93  | 30  | 88  |
| Average Queue (ft)    | 0   | 245  | 28  | 3   | 28  |
| 95th Queue (ft)       | 4   | 831  | 84  | 19  | 82  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 1    |     |     |     |
| Queuing Penalty (veh) |     | 0    |     |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 108

## Intersection: 3: Midland Ave &amp; Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 51  | 4   | 119 |
| Average Queue (ft)    | 18  | 0   | 38  |
| 95th Queue (ft)       | 46  | 4   | 94  |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 31  | 10  | 46 | 25  | 6    | 841 | 86  | 50 |
| Average Queue (ft)    | 12  | 0   | 15 | 2   | 0    | 821 | 23  | 11 |
| 95th Queue (ft)       | 35  | 5   | 43 | 14  | 5    | 905 | 69  | 39 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 72  |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 215 |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     |      |     | 2   | 0  |
| Queuing Penalty (veh) |     | 0   | 3  |     |      |     | 0   | 0  |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 199 | 197 | 85  | 62  |
| Average Queue (ft)    | 122 | 117 | 38  | 32  |
| 95th Queue (ft)       | 191 | 180 | 68  | 55  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 0   | 0   |     |     |
| Queuing Penalty (veh) | 1   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 72  | 102 | 31  | 96  |
| Average Queue (ft)    | 35  | 44  | 3   | 51  |
| 95th Queue (ft)       | 61  | 78  | 18  | 79  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 93 | 161 | 91 | 119 | 174 | 396 | 315 | 95  | 364 | 342 |
| Average Queue (ft)    | 40 | 55  | 36 | 37  | 63  | 190 | 148 | 14  | 180 | 170 |
| 95th Queue (ft)       | 85 | 116 | 78 | 85  | 149 | 353 | 290 | 54  | 329 | 317 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |    |     |     | 0   |     |     | 0   | 0   |
| Queuing Penalty (veh) |    | 0   |    |     |     | 0   |     |     | 0   | 0   |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 6  | 9   | 5  | 3   | 0   | 10  |     | 0   | 13  |     |
| Queuing Penalty (veh) | 5  | 3   | 2  | 1   | 0   | 8   |     | 0   | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 16  | 1559 | 173 | 61  | 37  |
| Average Queue (ft)    | 1   | 1242 | 70  | 8   | 11  |
| 95th Queue (ft)       | 8   | 2043 | 207 | 37  | 36  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 63   | 5   |     |     |
| Queuing Penalty (veh) |     | 0    | 0   |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 242

Intersection: 3: Midland Ave & Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 62  | 11  | 143 |
| Average Queue (ft)    | 21  | 0   | 54  |
| 95th Queue (ft)       | 51  | 5   | 114 |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  | 0   |     |     |
| Queuing Penalty (veh) | 0   |     |     |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB  |
|-----------------------|-----|-----|----|-----|------|-----|-----|-----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R   |
| Maximum Queue (ft)    | 56  | 18  | 50 | 33  | 27   | 839 | 238 | 100 |
| Average Queue (ft)    | 19  | 1   | 18 | 3   | 2    | 784 | 76  | 50  |
| 95th Queue (ft)       | 46  | 9   | 47 | 20  | 14   | 992 | 180 | 101 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824 | 327 |     |
| Upstream Blk Time (%) |     |     |    |     |      | 65  | 0   |     |
| Queuing Penalty (veh) |     |     |    |     |      | 132 | 0   |     |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75  |
| Storage Blk Time (%)  | 0   | 0   | 0  |     |      |     | 17  | 4   |
| Queuing Penalty (veh) | 0   | 0   | 2  |     |      |     | 10  | 2   |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 190 | 192 | 90  | 69  |
| Average Queue (ft)    | 106 | 114 | 40  | 34  |
| 95th Queue (ft)       | 170 | 175 | 70  | 58  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 0   | 0   |     |     |
| Queuing Penalty (veh) | 1   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 84  | 83  | 78  |
| Average Queue (ft)    | 40  | 41  | 38  |
| 95th Queue (ft)       | 67  | 69  | 60  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 96 | 170 | 100 | 228 | 174 | 460 | 462 | 126 | 328 | 321 |
| Average Queue (ft)    | 49 | 53  | 37  | 96  | 42  | 369 | 325 | 25  | 152 | 151 |
| 95th Queue (ft)       | 96 | 127 | 91  | 203 | 124 | 557 | 533 | 73  | 294 | 292 |
| Link Distance (ft)    |    | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |     | 1   |     | 10  | 6   |     | 0   |     |
| Queuing Penalty (veh) |    | 0   |     | 0   |     | 0   | 0   |     | 0   |     |
| Storage Bay Dist (ft) | 75 |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 12 | 6   | 4   | 26  | 0   | 20  |     | 0   | 10  |     |
| Queuing Penalty (veh) | 8  | 3   | 4   | 9   | 0   | 10  |     | 0   | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 3   | 1524 | 184 | 58  | 67  |
| Average Queue (ft)    | 0   | 809  | 63  | 6   | 24  |
| 95th Queue (ft)       | 3   | 1798 | 187 | 33  | 56  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 23   | 3   |     |     |
| Queuing Penalty (veh) |     | 0    | 0   |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 183

## Intersection: 3: Midland Ave &amp; Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 52  | 6   | 92  |
| Average Queue (ft)    | 18  | 0   | 28  |
| 95th Queue (ft)       | 47  | 4   | 70  |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 34  | 30  | 53 | 35  | 15   | 841 | 73  | 47 |
| Average Queue (ft)    | 11  | 1   | 19 | 4   | 1    | 815 | 18  | 11 |
| 95th Queue (ft)       | 33  | 13  | 48 | 21  | 11   | 940 | 54  | 38 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 65  |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 209 |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 1  |     |      |     | 1   | 0  |
| Queuing Penalty (veh) |     | 0   | 5  |     |      |     | 0   | 0  |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 226 | 193 | 94  | 72  |
| Average Queue (ft)    | 153 | 115 | 40  | 32  |
| 95th Queue (ft)       | 239 | 176 | 72  | 60  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 6   | 0   |     |     |
| Queuing Penalty (veh) | 14  | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

## Intersection: 15: 9th Street &amp; Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 70  | 86  | 22  | 96  |
| Average Queue (ft)    | 33  | 42  | 1   | 50  |
| 95th Queue (ft)       | 55  | 72  | 11  | 80  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

## Intersection: 16: 9th Street &amp; SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 81 | 107 | 73 | 96  | 174 | 318 | 275 | 102 | 285 | 281 |
| Average Queue (ft)    | 28 | 40  | 24 | 32  | 58  | 153 | 116 | 17  | 125 | 112 |
| 95th Queue (ft)       | 65 | 83  | 60 | 70  | 135 | 285 | 237 | 58  | 254 | 238 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    |     |    |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |    |     |    |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 2  | 2   | 1  | 1   | 0   | 7   |     |     | 7   |     |
| Queuing Penalty (veh) | 1  | 1   | 0  | 0   | 0   | 6   |     |     | 1   |     |

## Intersection: 20: GMF/PnR &amp; Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 30  | 1545 | 349 | 214 | 60  |
| Average Queue (ft)    | 2   | 1038 | 182 | 58  | 17  |
| 95th Queue (ft)       | 13  | 1974 | 396 | 246 | 50  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 42   | 28  | 11  |     |
| Queuing Penalty (veh) |     | 0    | 0   | 0   |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

## Zone Summary

Zone wide Queuing Penalty: 238



Intersection: 3: Midland Ave & Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 57  | 12  | 117 |
| Average Queue (ft)    | 18  | 0   | 45  |
| 95th Queue (ft)       | 49  | 6   | 88  |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  | 0   |     |     |
| Queuing Penalty (veh) | 0   |     |     |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 58  | 11  | 54 | 35  | 27   | 840 | 94  | 88 |
| Average Queue (ft)    | 18  | 0   | 20 | 3   | 2    | 776 | 33  | 39 |
| 95th Queue (ft)       | 45  | 7   | 50 | 20  | 15   | 997 | 77  | 75 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 56  |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 133 |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  | 0   | 0   | 1  |     |      |     | 2   | 3  |
| Queuing Penalty (veh) | 0   | 0   | 3  |     |      |     | 1   | 1  |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 220 | 176 | 119 | 92  |
| Average Queue (ft)    | 145 | 105 | 48  | 37  |
| 95th Queue (ft)       | 232 | 164 | 93  | 71  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 5   | 0   |     |     |
| Queuing Penalty (veh) | 13  | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

## Queuing and Blocking Report

01/02/2025

### Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 62  | 96  | 78  |
| Average Queue (ft)    | 31  | 44  | 37  |
| 95th Queue (ft)       | 52  | 77  | 62  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

### Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 97 | 175 | 100 | 255 | 174 | 481 | 464 | 110 | 309 | 295 |
| Average Queue (ft)    | 47 | 59  | 38  | 108 | 61  | 407 | 372 | 25  | 131 | 120 |
| 95th Queue (ft)       | 95 | 136 | 95  | 212 | 164 | 553 | 554 | 72  | 262 | 247 |
| Link Distance (ft)    |    | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 1   |     | 1   |     | 25  | 20  |     |     |     |
| Queuing Penalty (veh) |    | 1   |     | 0   |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 15 | 7   | 4   | 35  | 0   | 34  |     |     | 8   |     |
| Queuing Penalty (veh) | 10 | 3   | 4   | 11  | 0   | 18  |     |     | 2   |     |

### Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 7   | 1019 | 273 | 94  | 127 |
| Average Queue (ft)    | 0   | 450  | 121 | 34  | 42  |
| 95th Queue (ft)       | 4   | 1166 | 322 | 160 | 119 |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 0    | 11  | 6   | 1   |
| Queuing Penalty (veh) |     | 0    | 0   | 0   | 0   |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

### Zone Summary

Zone wide Queuing Penalty: 202

Intersection: 3: Midland Ave & Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 44  | 4   | 101 |
| Average Queue (ft)    | 17  | 0   | 32  |
| 95th Queue (ft)       | 43  | 3   | 79  |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 40  | 25  | 49 | 39  | 18   | 840 | 68  | 53 |
| Average Queue (ft)    | 12  | 2   | 18 | 3   | 1    | 811 | 19  | 12 |
| 95th Queue (ft)       | 35  | 16  | 47 | 19  | 8    | 955 | 56  | 41 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 70  |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 226 |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     |      |     | 1   | 0  |
| Queuing Penalty (veh) |     | 0   | 4  |     |      |     | 0   | 0  |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 225 | 192 | 94  | 81  |
| Average Queue (ft)    | 165 | 129 | 41  | 37  |
| 95th Queue (ft)       | 232 | 186 | 73  | 65  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 4   | 0   |     |     |
| Queuing Penalty (veh) | 10  | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 66  | 82  | 33  | 97  |
| Average Queue (ft)    | 34  | 42  | 3   | 54  |
| 95th Queue (ft)       | 57  | 70  | 19  | 85  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 86 | 129 | 72 | 81  | 174 | 380 | 315 | 92  | 290 | 277 |
| Average Queue (ft)    | 31 | 51  | 26 | 32  | 61  | 193 | 147 | 18  | 147 | 129 |
| 95th Queue (ft)       | 68 | 99  | 62 | 65  | 139 | 335 | 275 | 59  | 265 | 251 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |    |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |    | 0   |    |     |     | 0   |     |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 2  | 4   | 2  | 1   | 0   | 11  |     | 0   | 10  |     |
| Queuing Penalty (veh) | 2  | 1   | 1  | 0   | 0   | 9   |     | 0   | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 22  | 1550 | 344 | 180 | 76  |
| Average Queue (ft)    | 1   | 1125 | 209 | 38  | 19  |
| 95th Queue (ft)       | 10  | 2069 | 408 | 182 | 58  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 56   | 33  | 6   |     |
| Queuing Penalty (veh) |     | 0    | 0   | 0   |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 256

## Intersection: 3: Midland Ave &amp; Deveraux Road

| Movement              | SE  | NW  | SW  |
|-----------------------|-----|-----|-----|
| Directions Served     | L   | TR  | LR  |
| Maximum Queue (ft)    | 59  | 9   | 146 |
| Average Queue (ft)    | 22  | 0   | 55  |
| 95th Queue (ft)       | 51  | 5   | 118 |
| Link Distance (ft)    |     | 552 | 774 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) | 100 |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB   | SB  | SB |
|-----------------------|-----|-----|----|-----|------|------|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR  | LT  | R  |
| Maximum Queue (ft)    | 62  | 8   | 56 | 35  | 56   | 840  | 103 | 88 |
| Average Queue (ft)    | 18  | 0   | 18 | 3   | 3    | 765  | 37  | 38 |
| 95th Queue (ft)       | 48  | 5   | 48 | 17  | 29   | 1025 | 80  | 76 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 824  | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 60   |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 143  |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |      |     | 75 |
| Storage Blk Time (%)  | 0   | 0   | 0  |     | 0    |      | 3   | 2  |
| Queuing Penalty (veh) | 0   | 0   | 2  |     | 0    |      | 2   | 1  |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 227 | 173 | 119 | 101 |
| Average Queue (ft)    | 159 | 113 | 49  | 40  |
| 95th Queue (ft)       | 242 | 169 | 91  | 77  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 6   |     |     |     |
| Queuing Penalty (veh) | 14  |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 67  | 83  | 83  |
| Average Queue (ft)    | 34  | 44  | 39  |
| 95th Queue (ft)       | 54  | 75  | 65  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB  | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 99  | 200 | 100 | 238 | 174 | 470 | 448 | 136 | 323 | 315 |
| Average Queue (ft)    | 52  | 68  | 39  | 113 | 54  | 411 | 381 | 31  | 143 | 130 |
| 95th Queue (ft)       | 104 | 158 | 94  | 216 | 149 | 543 | 547 | 90  | 285 | 272 |
| Link Distance (ft)    |     | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |     | 1   |     | 1   |     | 26  | 22  |     |     |     |
| Queuing Penalty (veh) |     | 2   |     | 0   |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75  |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 15  | 10  | 4   | 37  | 0   | 34  |     | 0   | 9   |     |
| Queuing Penalty (veh) | 11  | 5   | 4   | 12  | 2   | 20  |     | 0   | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 3   | 1368 | 318 | 122 | 132 |
| Average Queue (ft)    | 0   | 649  | 158 | 32  | 37  |
| 95th Queue (ft)       | 3   | 1567 | 368 | 166 | 99  |
| Link Distance (ft)    | 824 | 1500 | 334 | 334 | 253 |
| Upstream Blk Time (%) |     | 12   | 23  | 6   | 0   |
| Queuing Penalty (veh) |     | 0    | 0   | 0   | 0   |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

Zone Summary

Zone wide Queuing Penalty: 221

## Appendix D - APRIL 2023 TRAFFIC COUNTS

|            |                                   |
|------------|-----------------------------------|
| Study Name | 8th&Colorado                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

Traffic Study

|                           |                                                           |         |
|---------------------------|-----------------------------------------------------------|---------|
| Start Date                | Tuesday, April 25, 2023 11:00 AM                          |         |
| End Date                  | Wednesday, April 26, 2023 6:45 PM                         |         |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |         |
| 04/25/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/25/2023 PM Peaks       | 12:00 PM - 1:00 PM                                        |         |
| 04/25/2023 PM Peaks       | 5:00 PM - 6:00 PM                                         |         |
| 04/26/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/26/2023 PM Peaks       | 12:00 PM - 1:00 PM                                        | 729 DHV |
| 04/26/2023 PM Peaks       | 4:45 PM - 5:45 PM                                         | 557 DHV |





Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |                 |    |       |    |  |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|-----------------|----|-------|----|--|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     | s on Credestria |    | Total |    |  |
| Peak 1              | Lights     | 11         | 10   | 24   | 0  | 45   | 60   | 29        | 99   | 25   | 0    | 153  | 182  | 14         | 7    | 18   | 0  | 39   | 77   | 42        | 144  | 24   | 0  | 210  | 128  | 447       | N               | 0  | 11    | 11 |  |
| Specified Period    | %          | 100%       | 91%  | 89%  | 0% | 92%  | 97%  | 97%       | 97%  | 100% | 0%   | 97%  | 96%  | 93%        | 88%  | 78%  | 0% | 85%  | 92%  | 88%       | 97%  | 100% | 0% | 95%  | 94%  | 95%       |                 | 0% | 100%  |    |  |
| 11:00 AM - 12:00 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0    | 4    | 0  | 4    | 4    | 4         | 0    | 0    | 0  | 4    | 5    | 9         | E               | 0  | 13    | 13 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 17%  | 0% | 9%   | 5%   | 8%        | 0%   | 0%   | 0% | 2%   | 4%   | 2%        |                 | 0% | 100%  |    |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 1    | 3    | 0  | 4    | 2    | 1         | 2    | 0    | 0    | 3    | 8    | 1          | 1    | 1    | 0  | 3    | 3    | 2         | 4    | 0    | 0  | 6    | 3    | 16        | S               | 0  | 10    | 10 |  |
|                     | %          | 0%         | 9%   | 11%  | 0% | 8%   | 3%   | 3%        | 2%   | 0%   | 0%   | 2%   | 4%   | 7%         | 13%  | 4%   | 0% | 7%   | 4%   | 4%        | 3%   | 0%   | 0% | 3%   | 2%   | 3%        |                 | 0% | 100%  |    |  |
|                     | Total      | 11         | 11   | 27   | 0  | 49   | 62   | 30        | 102  | 25   | 0    | 157  | 190  | 15         | 8    | 23   | 0  | 46   | 84   | 48        | 148  | 24   | 0  | 220  | 136  | 472       | W               | 0  | 12    | 12 |  |
|                     | PHF        | 0.55       | 0.69 | 0.75 | 0  | 0.82 | 0.74 | 0.68      | 0.75 | 0.78 | 0    | 0.8  | 0.91 | 0.75       | 0.67 | 0.64 | 0  | 0.72 | 0.88 | 0.71      | 0.95 | 0.67 | 0  | 0.86 | 0.85 | 0.92      |                 | 0% | 100%  |    |  |
|                     | Approach % |            |      |      |    | 10%  | 13%  |           |      |      |      | 33%  | 40%  |            |      |      |    | 10%  | 18%  |           |      |      |    | 47%  | 29%  |           |                 | 0  | 46    | 46 |  |
| Peak 2              | Lights     | 12         | 15   | 36   | 0  | 63   | 71   | 39        | 99   | 22   | 1    | 161  | 225  | 22         | 0    | 34   | 0  | 56   | 108  | 71        | 166  | 32   | 0  | 269  | 145  | 549       | N               | 0  | 29    | 29 |  |
| Specified Period    | %          | 100%       | 100% | 100% | 0% | 100% | 97%  | 95%       | 99%  | 100% | 100% | 98%  | 99%  | 100%       | 0%   | 89%  | 0% | 93%  | 97%  | 96%       | 99%  | 100% | 0% | 98%  | 97%  | 98%       |                 | 0% | 100%  |    |  |
| 12:00 PM - 1:30 PM  | Buses      | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 0    | 0    | 0    | 1    | 1    | 0          | 0    | 4    | 0  | 4    | 3    | 3         | 1    | 0    | 0  | 4    | 4    | 9         | E               | 0  | 39    | 39 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 2%        | 0%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 11%  | 0% | 7%   | 3%   | 4%        | 1%   | 0%   | 0% | 1%   | 3%   | 2%        |                 | 0% | 100%  |    |  |
| 12:00 PM - 1:00 PM  | Trucks     | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 1    | 0    | 0    | 2    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0  | 1    | 1    | 3         | S               | 0  | 0     | 0  |  |
|                     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 2%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 0%   | 1%   | 1%        |                 | 0% | 0%    |    |  |
|                     | Total      | 12         | 15   | 36   | 0  | 63   | 73   | 41        | 100  | 22   | 1    | 164  | 227  | 22         | 0    | 38   | 0  | 60   | 111  | 74        | 168  | 32   | 0  | 274  | 150  | 561       | W               | 0  | 14    | 14 |  |
|                     | PHF        | 0.38       | 0.54 | 0.69 | 0  | 0.56 | 0.79 | 0.73      | 0.86 | 0.92 | 0.25 | 0.89 | 0.87 | 0.55       | 0    | 0.68 | 0  | 0.83 | 0.77 | 0.8       | 0.88 | 0.73 | 0  | 0.89 | 0.87 | 0.86      |                 | 0% | 100%  |    |  |
|                     | Approach % |            |      |      |    | 11%  | 13%  |           |      |      |      | 29%  | 40%  |            |      |      |    | 11%  | 20%  |           |      |      |    | 49%  | 27%  |           |                 | 0  | 82    | 82 |  |
| Peak 3              | Lights     | 17         | 14   | 39   | 0  | 70   | 85   | 49        | 158  | 22   | 0    | 229  | 195  | 17         | 16   | 36   | 0  | 69   | 79   | 43        | 139  | 20   | 0  | 202  | 211  | 570       | N               | 0  | 26    | 26 |  |
| Specified Period    | %          | 100%       | 100% | 98%  | 0% | 99%  | 100% | 100%      | 100% | 100% | 0%   | 100% | 99%  | 100%       | 100% | 88%  | 0% | 93%  | 94%  | 90%       | 100% | 100% | 0% | 98%  | 98%  | 98%       |                 | 0% | 100%  |    |  |
| 4:00 PM - 6:30 PM   | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 0          | 0    | 5    | 0  | 5    | 5    | 5         | 0    | 0    | 0  | 5    | 5    | 10        | E               | 0  | 17    | 17 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 0%         | 0%   | 12%  | 0% | 7%   | 6%   | 10%       | 0%   | 0%   | 0% | 2%   | 2%   | 2%        |                 | 0% | 100%  |    |  |
| 5:00 PM - 6:00 PM   | Trucks     | 0          | 0    | 1    | 0  | 1    | 0    | 0         | 0    | 0    | 0    | 0    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0  | 0    | 0    | 1         | S               | 0  | 14    | 14 |  |
|                     | %          | 0%         | 0%   | 3%   | 0% | 1%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%        |                 | 0% | 100%  |    |  |
|                     | Total      | 17         | 14   | 40   | 0  | 71   | 85   | 49        | 158  | 22   | 0    | 229  | 196  | 17         | 16   | 41   | 0  | 74   | 84   | 48        | 139  | 20   | 0  | 207  | 216  | 581       | W               | 0  | 0     | 0  |  |
|                     | PHF        | 0.85       | 0.7  | 0.77 | 0  | 0.93 | 0.73 | 0.82      | 0.86 | 0.69 | 0    | 0.91 | 0.86 | 0.71       | 0.67 | 0.85 | 0  | 0.77 | 0.75 | 0.8       | 0.83 | 0.62 | 0  | 0.92 | 0.89 | 0.95      |                 | 0% | 0%    |    |  |
|                     | Approach % |            |      |      |    | 12%  | 15%  |           |      |      |      | 39%  | 34%  |            |      |      |    | 13%  | 14%  |           |      |      |    | 36%  | 37%  |           |                 | 0  | 57    | 57 |  |
|                     |            |            |      |      |    |      |      |           |      |      |      |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |                 |    |       |    |  |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |                 |    |       |     |  |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|-----------------|----|-------|-----|--|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     | s on Credestria |    | Total |     |  |
| Peak 1              | Lights     | 14         | 15   | 35   | 0  | 64   | 72   | 42        | 168  | 84   | 2    | 296  | 197  | 13         | 14   | 24   | 0  | 51   | 140  | 41        | 147  | 16   | 0  | 204  | 206  | 615       | N               | 0  | 52    | 52  |  |
| Specified Period    | %          | 100%       | 94%  | 97%  | 0% | 97%  | 99%  | 98%       | 99%  | 100% | 100% | 99%  | 99%  | 100%       | 100% | 83%  | 0% | 91%  | 97%  | 93%       | 99%  | 100% | 0% | 98%  | 97%  | 98%       |                 | 0% | 100%  |     |  |
| 11:00 AM - 12:00 PM | Buses      | 0          | 1    | 0    | 0  | 1    | 1    | 1         | 1    | 0    | 0    | 2    | 0    | 0          | 0    | 5    | 0  | 5    | 4    | 3         | 0    | 0    | 0  | 3    | 6    | 11        | E               | 0  | 32    | 32  |  |
| One Hour Peak       | %          | 0%         | 6%   | 0%   | 0% | 2%   | 1%   | 2%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 17%  | 0% | 9%   | 3%   | 7%        | 0%   | 0%   | 0% | 1%   | 3%   | 2%        |                 | 0% | 100%  |     |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 0    | 1    | 0  | 1    | 0    | 0         | 1    | 0    | 0    | 1    | 3    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 2    | 0    | 0  | 2    | 1    | 4         | S               | 0  | 12    | 12  |  |
|                     | %          | 0%         | 0%   | 3%   | 0% | 2%   | 0%   | 0%        | 1%   | 0%   | 0%   | 0%   | 2%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 0%   | 1%        |                 | 0% | 100%  |     |  |
|                     | Total      | 14         | 16   | 36   | 0  | 66   | 73   | 43        | 170  | 84   | 2    | 299  | 200  | 13         | 14   | 29   | 0  | 56   | 144  | 44        | 149  | 16   | 0  | 209  | 213  | 630       | W               | 0  | 18    | 18  |  |
|                     | PHF        | 0.7        | 0.67 | 0.64 | 0  | 0.72 | 0.68 | 0.9       | 0.9  | 0.68 | 0.5  | 0.82 | 0.86 | 0.81       | 0.58 | 0.66 | 0  | 0.82 | 0.84 | 0.69      | 0.96 | 0.44 | 0  | 0.86 | 0.85 | 0.93      |                 | 0% | 100%  |     |  |
|                     | Approach % |            |      |      |    | 10%  | 12%  |           |      |      |      | 47%  | 32%  |            |      |      |    | 9%   | 23%  |           |      |      |    | 33%  | 34%  |           |                 | 0  | 114   | 114 |  |
| Peak 2              | Lights     | 20         | 23   | 18   | 0  | 61   | 95   | 67        | 164  | 109  | 1    | 341  | 218  | 17         | 16   | 34   | 0  | 67   | 177  | 45        | 182  | 12   | 0  | 239  | 218  | 708       | N               | 0  | 50    | 50  |  |
| Specified Period    | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 100%      | 96%  | 98%  | 100% | 98%  | 99%  | 100%       | 100% | 89%  | 0% | 94%  | 96%  | 88%       | 98%  | 100% | 0% | 96%  | 96%  | 97%       |                 | 0% | 100%  |     |  |
| 12:00 PM - 1:30 PM  | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0    | 4    | 0  | 4    | 5    | 5         | 0    | 0    | 0  | 5    | 5    | 10        | E               | 1  | 39    | 40  |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 0%   | 0%   | 0%         | 0%   | 11%  | 0% | 6%   | 3%   | 10%       | 0%   | 0%   | 0% | 2%   | 2%   | 1%        |                 | 3% | 98%   |     |  |
| 12:00 PM - 1:00 PM  | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 5    | 2    | 0    | 7    | 3    | 0          | 0    | 0    | 0  | 0    | 3    | 1         | 3    | 0    | 0  | 4    | 5    | 11        | S               | 1  | 22    | 23  |  |
| Pedestrians         | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 3%   | 2%   | 0%   | 2%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 2%   | 2%        | 2%   | 0%   | 0% | 2%   | 2%   | 2%        |                 | 4% | 96%   |     |  |
| 151                 | Total      | 20         | 23   | 18   | 0  | 61   | 95   | 67        | 170  | 111  | 1    | 349  | 221  | 17         | 16   | 38   | 0  | 71   | 185  | 51        | 185  | 12   | 0  | 248  | 228  | 729       | W               | 0  | 38    | 38  |  |
|                     | PHF        | 0.71       | 0.64 | 0.56 | 0  | 0.9  | 0.79 | 0.8       | 0.71 | 0.87 | 0.25 | 0.82 | 0.89 | 0.71       | 0.57 | 0.79 | 0  | 0.74 | 0.86 | 0.8       | 0.87 | 0.75 | 0  | 0.9  | 0.76 | 0.88      |                 | 0% | 100%  |     |  |
|                     | Approach % |            |      |      |    | 8%   | 13%  |           |      |      |      | 48%  | 30%  |            |      |      |    | 10%  | 25%  |           |      |      |    | 34%  | 31%  | 2.9%      |                 | 2  | 149   | 151 |  |
| Peak 3              | Lights     | 17         | 15   | 28   | 0  | 60   | 85   | 53        | 125  | 19   | 1    | 198  | 202  | 24         | 7    | 32   | 0  | 63   | 79   | 45        | 149  | 25   | 0  | 219  | 174  | 540       | N               | 0  | 26    | 26  |  |
| Specified Period    | %          | 100%       | 100% | 97%  | 0% | 98%  | 99%  | 100%      | 98%  | 100% | 50%  | 99%  | 98%  | 100%       | 88%  | 89%  | 0% | 93%  | 93%  | 88%       | 99%  | 100% | 0% | 96%  | 97%  | 97%       |                 | 0% | 100%  |     |  |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0    | 4    | 0  | 4    | 3    | 3         | 0    | 0    | 0  | 3    | 5    | 8         | E               | 1  | 13    | 14  |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 0%   | 0%   | 0%         | 0%   | 11%  | 0% | 6%   | 4%   | 6%        | 0%   | 0%   | 0% | 1%   | 3%   | 1%        |                 | 7% | 93%   |     |  |
| 4:45 PM - 5:45 PM   | Trucks     | 0          | 0    | 1    | 0  | 1    | 1    | 0         | 1    | 0    | 1    | 2    | 4    | 0          | 1    | 0    | 0  | 1    | 3    | 3         | 2    | 0    | 0  | 5    | 1    | 9         | S               | 0  | 22    | 22  |  |
| Pedestrians         | %          | 0%         | 0%   | 3%   | 0% | 2%   | 1%   | 0%        | 1%   | 0%   | 50%  | 1%   | 2%   | 0%         | 13%  | 0%   | 0% | 1%   | 4%   | 6%        | 1%   | 0%   | 0% | 2%   | 1%   | 2%        |                 | 0% | 100%  |     |  |
| 74                  | Total      | 17         | 15   | 29   | 0  | 61   | 86   | 53        | 127  | 19   | 2    | 201  | 206  | 24         | 8    | 36   | 0  | 68   | 85   | 51        | 151  | 25   | 0  | 227  | 180  | 557       | W               | 0  | 12    | 12  |  |
|                     | PHF        | 0.85       | 0.75 | 0.72 | 0  | 0.8  | 0.83 | 0.83      | 0.88 | 0.79 | 0.5  | 0.9  | 0.9  | 0.67       | 0.5  | 0.9  | 0  | 0.74 | 0.85 | 0.8       | 0.92 | 0.78 | 0  | 0.93 | 0.92 | 0.95      |                 | 0% | 100%  |     |  |
|                     | Approach % |            |      |      |    | 11%  | 15%  |           |      |      |      | 36%  | 37%  |            |      |      |    | 12%  | 15%  |           |      |      |    | 41%  | 32%  | 3.1%      |                 | 1  | 73    | 74  |  |
|                     |            |            |      |      |    |      |      |           |      |      |      |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |                 |    |       |     |  |

|            |                                   |
|------------|-----------------------------------|
| Study Name | 9th & Colorado                    |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

Traffic Study

|                           |                                                           |         |
|---------------------------|-----------------------------------------------------------|---------|
| Start Date                | Tuesday, April 25, 2023 11:00 AM                          |         |
| End Date                  | Wednesday, April 26, 2023 6:45 PM                         |         |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |         |
| 04/25/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/25/2023 PM Peaks       | 12:30 PM - 1:30 PM                                        |         |
| 04/25/2023 PM Peaks       | 4:15 PM - 5:15 PM                                         |         |
| 04/26/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/26/2023 PM Peaks       | 12:15 PM - 1:15 PM                                        | 352 DHV |
| 04/26/2023 PM Peaks       | 4:30 PM - 5:30 PM                                         | 273 DHV |



|            |                                   |
|------------|-----------------------------------|
| Study Name | 9th & Colorado                    |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |   |                 |       |    |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|------|------|------|-----------|---|-----------------|-------|----|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     |   | s on Credestria | Total |    |
| Peak 1              | Lights     | 15         | 25   | 38   | 0  | 78   | 43   | 33        | 28   | 8    | 0  | 69   | 75   | 0          | 0    | 1    | 0  | 1    | 49   | 16        | 37   | 10   | 0    | 63   | 44   | 211       | N | 0               | 0     | 0  |
| Specified Period    | %          | 100%       | 93%  | 88%  | 0% | 92%  | 90%  | 89%       | 97%  | 100% | 0% | 93%  | 91%  | 0%         | 0%   | 100% | 0% | 100% | 96%  | 100%      | 95%  | 91%  | 0%   | 95%  | 98%  | 93%       |   | 0%              | 0%    |    |
| 11:00 AM - 12:00 PM | Buses      | 0          | 0    | 3    | 0  | 3    | 5    | 4         | 0    | 0    | 0  | 4    | 3    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 1    | 0    | 1    | 0    | 8         | E | 0               | 6     | 6  |
| One Hour Peak       | %          | 0%         | 0%   | 7%   | 0% | 4%   | 10%  | 11%       | 0%   | 0%   | 0% | 5%   | 4%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 9%   | 0%   | 2%   | 0%   | 4%        |   | 0%              | 100%  |    |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 2    | 2    | 0  | 4    | 0    | 0         | 1    | 0    | 0  | 1    | 4    | 0          | 0    | 0    | 0  | 0    | 2    | 0         | 2    | 0    | 0    | 2    | 1    | 7         | S | 0               | 4     | 4  |
|                     | %          | 0%         | 7%   | 5%   | 0% | 5%   | 0%   | 0%        | 3%   | 0%   | 0% | 1%   | 5%   | 0%         | 0%   | 0%   | 0% | 0%   | 4%   | 0%        | 5%   | 0%   | 0%   | 3%   | 2%   | 3%        |   | 0%              | 100%  |    |
|                     | Total      | 15         | 27   | 43   | 0  | 85   | 48   | 37        | 29   | 8    | 0  | 74   | 82   | 0          | 0    | 1    | 0  | 1    | 51   | 16        | 39   | 11   | 0    | 66   | 45   | 226       | W | 0               | 14    | 14 |
|                     | PHF        | 0.54       | 0.68 | 0.9  | 0  | 0.92 | 0.57 | 0.58      | 0.66 | 0.67 | 0  | 0.64 | 0.89 | 0          | 0    | 0.25 | 0  | 0.25 | 0.64 | 0.5       | 0.81 | 0.55 | 0    | 0.75 | 0.8  | 0.8       |   | 0%              | 100%  |    |
|                     | Approach % |            |      |      |    | 38%  | 21%  |           |      |      |    | 33%  | 36%  |            |      |      |    | 0%   | 23%  |           |      |      |      | 29%  | 20%  |           |   | 0               | 24    | 24 |
| Peak 2              | Lights     | 27         | 48   | 38   | 0  | 113  | 64   | 37        | 37   | 5    | 0  | 79   | 93   | 0          | 3    | 0    | 0  | 3    | 68   | 15        | 55   | 24   | 1    | 95   | 65   | 290       | N | 0               | 20    | 20 |
| Specified Period    | %          | 100%       | 100% | 90%  | 0% | 97%  | 90%  | 84%       | 97%  | 100% | 0% | 91%  | 94%  | 0%         | 100% | 0%   | 0% | 100% | 99%  | 94%       | 96%  | 100% | 100% | 97%  | 98%  | 95%       |   | 0%              | 100%  |    |
| 12:00 PM - 1:45 PM  | Buses      | 0          | 0    | 4    | 0  | 4    | 6    | 6         | 0    | 0    | 0  | 6    | 5    | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 1    | 0    | 0    | 2    | 0    | 12        | E | 0               | 17    | 17 |
| One Hour Peak       | %          | 0%         | 0%   | 10%  | 0% | 3%   | 8%   | 14%       | 0%   | 0%   | 0% | 7%   | 5%   | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 6%        | 2%   | 0%   | 0%   | 2%   | 0%   | 4%        |   | 0%              | 100%  |    |
| 12:30 PM - 1:30 PM  | Trucks     | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 1    | 0    | 0  | 2    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 1    | 3         | S | 0               | 8     | 8  |
|                     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 2%        | 3%   | 0%   | 0% | 2%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 2%   | 0%   | 0%   | 1%   | 2%   | 1%        |   | 0%              | 100%  |    |
|                     | Total      | 27         | 48   | 42   | 0  | 117  | 71   | 44        | 38   | 5    | 0  | 87   | 99   | 0          | 3    | 0    | 0  | 3    | 69   | 16        | 57   | 24   | 1    | 98   | 66   | 305       | W | 0               | 28    | 28 |
|                     | PHF        | 0.61       | 0.8  | 0.66 | 0  | 0.77 | 0.89 | 0.79      | 0.73 | 0.62 | 0  | 0.81 | 0.82 | 0          | 0.25 | 0    | 0  | 0.25 | 0.78 | 0.67      | 0.71 | 0.86 | 0.25 | 0.82 | 0.69 | 0.87      |   | 0%              | 100%  |    |
|                     | Approach % |            |      |      |    | 38%  | 23%  |           |      |      |    | 29%  | 32%  |            |      |      |    | 1%   | 23%  |           |      |      |      | 32%  | 22%  |           |   | 0               | 73    | 73 |
| Peak 3              | Lights     | 12         | 29   | 32   | 0  | 73   | 52   | 40        | 48   | 7    | 0  | 95   | 100  | 0          | 0    | 0    | 0  | 0    | 50   | 14        | 68   | 12   | 0    | 94   | 60   | 262       | N | 0               | 11    | 11 |
| Specified Period    | %          | 92%        | 100% | 84%  | 0% | 91%  | 91%  | 89%       | 98%  | 100% | 0% | 94%  | 93%  | 0%         | 0%   | 0%   | 0% | 0%   | 100% | 100%      | 99%  | 100% | 0%   | 99%  | 97%  | 95%       |   | 0%              | 100%  |    |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 0    | 6    | 0  | 6    | 4    | 4         | 0    | 0    | 0  | 4    | 6    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 10        | E | 0               | 6     | 6  |
| One Hour Peak       | %          | 0%         | 0%   | 16%  | 0% | 8%   | 7%   | 9%        | 0%   | 0%   | 0% | 4%   | 6%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 4%        |   | 0%              | 100%  |    |
| 4:15 PM - 5:15 PM   | Trucks     | 1          | 0    | 0    | 0  | 1    | 1    | 1         | 1    | 0    | 0  | 2    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 2    | 4         | S | 0               | 1     | 1  |
|                     | %          | 8%         | 0%   | 0%   | 0% | 1%   | 2%   | 2%        | 2%   | 0%   | 0% | 2%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 3%   | 1%        |   | 0%              | 100%  |    |
|                     | Total      | 13         | 29   | 38   | 0  | 80   | 57   | 45        | 49   | 7    | 0  | 101  | 107  | 0          | 0    | 0    | 0  | 0    | 50   | 14        | 69   | 12   | 0    | 95   | 62   | 276       | W | 0               | 26    | 26 |
|                     | PHF        | 0.46       | 0.72 | 0.86 | 0  | 0.74 | 0.84 | 0.7       | 0.77 | 0.58 | 0  | 0.9  | 0.86 | 0          | 0    | 0    | 0  | 0    | 0.78 | 0.7       | 0.82 | 0.75 | 0    | 0.88 | 0.82 | 0.87      |   | 0%              | 100%  |    |
|                     | Approach % |            |      |      |    | 29%  | 21%  |           |      |      |    | 37%  | 39%  |            |      |      |    | 0%   | 18%  |           |      |      |      | 34%  | 22%  |           |   | 0               | 44    | 44 |
|                     |            |            |      |      |    |      |      |           |      |      |    |      |      |            |      |      |    |      |      |           |      |      |      |      |      |           |   |                 |       |    |

|            |                                   |
|------------|-----------------------------------|
| Study Name | 9th & Colorado                    |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |    |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |    |                 |       |    |  |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|----|------|----|------|------|-----------|------|------|------|------|------|-----------|----|-----------------|-------|----|--|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T  | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     |    | s on Credestria | Total |    |  |
| Peak 1              | Lights     | 14         | 71   | 51   | 0  | 136  | 57   | 49        | 32   | 7    | 2    | 90   | 80   | 0          | 0  | 0    | 0  | 0    | 91   | 13        | 27   | 8    | 1    | 49   | 47   | 275       | N  | 0               | 10    | 10 |  |
| Specified Period    | %          | 100%       | 100% | 94%  | 0% | 98%  | 92%  | 91%       | 97%  | 100% | 100% | 94%  | 96%  | 0%         | 0% | 0%   | 0% | 0%   | 100% | 100%      | 100% | 100% | 100% | 98%  | 97%  |           | 0% | 100%            |       |    |  |
| 11:00 AM - 12:00 PM | Buses      | 0          | 0    | 3    | 0  | 3    | 5    | 5         | 0    | 0    | 0    | 5    | 3    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 8         | E  | 0               | 12    | 12 |  |
| One Hour Peak       | %          | 0%         | 0%   | 6%   | 0% | 2%   | 8%   | 9%        | 0%   | 0%   | 0%   | 5%   | 4%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 3%   |           | 0% | 100%            |       |    |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 1    | 1         | S  | 0               | 13    | 13 |  |
|                     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 3%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 2%   | 0%   |           | 0% | 100%            |       |    |  |
|                     | Total      | 14         | 71   | 54   | 0  | 139  | 62   | 54        | 33   | 7    | 2    | 96   | 83   | 0          | 0  | 0    | 0  | 0    | 91   | 13        | 27   | 8    | 1    | 49   | 48   | 284       | W  | 1               | 22    | 23 |  |
|                     | PHF        | 0.7        | 0.66 | 0.79 | 0  | 0.81 | 0.82 | 0.71      | 0.82 | 0.58 | 0.5  | 0.73 | 0.86 | 0          | 0  | 0    | 0  | 0    | 0.65 | 0.65      | 0.75 | 0.5  | 0.25 | 0.82 | 0.86 | 0.79      |    | 4%              | 96%   |    |  |
|                     | Approach % |            |      |      |    | 49%  | 22%  |           |      |      |      | 34%  | 29%  |            |    |      |    | 0%   | 32%  |           |      |      |      | 17%  | 17%  |           |    | 1               | 57    | 58 |  |
| Peak 2              | Lights     | 27         | 114  | 50   | 0  | 191  | 68   | 48        | 27   | 7    | 2    | 84   | 75   | 0          | 0  | 2    | 0  | 2    | 134  | 13        | 23   | 20   | 1    | 57   | 57   | 334       | N  | 1               | 12    | 13 |  |
| Specified Period    | %          | 96%        | 99%  | 89%  | 0% | 96%  | 92%  | 89%       | 96%  | 100% | 100% | 92%  | 89%  | 0%         | 0% | 100% | 0% | 100% | 99%  | 100%      | 88%  | 100% | 100% | 95%  | 97%  | 95%       |    | 8%              | 92%   |    |  |
| 12:00 PM - 1:45 PM  | Buses      | 1          | 0    | 5    | 0  | 6    | 6    | 6         | 0    | 0    | 0    | 6    | 5    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 1    | 12        | E  | 0               | 9     | 9  |  |
| One Hour Peak       | %          | 4%         | 0%   | 9%   | 0% | 3%   | 8%   | 11%       | 0%   | 0%   | 0%   | 7%   | 6%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 2%   | 3%   |           | 0% | 100%            |       |    |  |
| 12:15 PM - 1:15 PM  | Trucks     | 0          | 1    | 1    | 0  | 2    | 0    | 0         | 1    | 0    | 0    | 1    | 4    | 0          | 0  | 0    | 0  | 0    | 1    | 0         | 3    | 0    | 0    | 3    | 1    | 6         | S  | 1               | 8     | 9  |  |
|                     | %          | 0%         | 1%   | 2%   | 0% | 1%   | 0%   | 0%        | 4%   | 0%   | 0%   | 1%   | 5%   | 0%         | 0% | 0%   | 0% | 0%   | 1%   | 0%        | 12%  | 0%   | 0%   | 5%   | 2%   | 2%        |    | 11%             | 89%   |    |  |
|                     | Total      | 28         | 115  | 56   | 0  | 199  | 74   | 54        | 28   | 7    | 2    | 91   | 84   | 0          | 0  | 2    | 0  | 2    | 135  | 13        | 26   | 20   | 1    | 60   | 59   | 352       | W  | 0               | 39    | 39 |  |
|                     | PHF        | 0.78       | 0.74 | 0.82 | 0  | 0.83 | 0.8  | 0.79      | 0.78 | 0.58 | 0.5  | 0.88 | 0.84 | 0          | 0  | 0.5  | 0  | 0.5  | 0.78 | 0.65      | 0.81 | 0.83 | 0.25 | 0.79 | 0.87 | 0.92      |    | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |    | 57%  | 21%  |           |      |      |      | 26%  | 24%  |            |    |      |    | 1%   | 38%  |           |      |      |      | 17%  | 17%  | 5.1%      |    | 2               | 68    | 70 |  |
| Peak 3              | Lights     | 14         | 34   | 43   | 0  | 91   | 44   | 32        | 40   | 16   | 0    | 88   | 99   | 0          | 0  | 0    | 0  | 0    | 64   | 14        | 56   | 12   | 0    | 82   | 54   | 261       | N  | 0               | 5     | 5  |  |
| Specified Period    | %          | 93%        | 100% | 91%  | 0% | 95%  | 90%  | 86%       | 98%  | 100% | 0%   | 94%  | 95%  | 0%         | 0% | 0%   | 0% | 0%   | 100% | 100%      | 98%  | 100% | 0%   | 99%  | 96%  | 96%       |    | 0%              | 100%  |    |  |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 0    | 4    | 0  | 4    | 4    | 4         | 0    | 0    | 0    | 4    | 4    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 8         | E  | 0               | 11    | 11 |  |
| One Hour Peak       | %          | 0%         | 0%   | 9%   | 0% | 4%   | 8%   | 11%       | 0%   | 0%   | 0%   | 4%   | 4%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 3%        |    | 0%              | 100%  |    |  |
| 4:30 PM - 5:30 PM   | Trucks     | 1          | 0    | 0    | 0  | 1    | 1    | 1         | 1    | 0    | 0    | 2    | 1    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 2    | 4         | S  | 0               | 6     | 6  |  |
|                     | %          | 7%         | 0%   | 0%   | 0% | 1%   | 2%   | 3%        | 2%   | 0%   | 0%   | 2%   | 1%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 2%   | 0%   | 0%   | 1%   | 4%   | 1%        |    | 0%              | 100%  |    |  |
|                     | Total      | 15         | 34   | 47   | 0  | 96   | 49   | 37        | 41   | 16   | 0    | 94   | 104  | 0          | 0  | 0    | 0  | 0    | 64   | 14        | 57   | 12   | 0    | 83   | 56   | 273       | W  | 0               | 11    | 11 |  |
|                     | PHF        | 0.62       | 0.85 | 0.62 | 0  | 0.89 | 0.77 | 0.84      | 0.64 | 0.57 | 0    | 0.81 | 0.93 | 0          | 0  | 0    | 0  | 0    | 0.84 | 0.7       | 0.75 | 0.6  | 0    | 0.83 | 0.67 | 0.9       |    | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |    | 35%  | 18%  |           |      |      |      | 34%  | 38%  |            |    |      |    | 0%   | 23%  |           |      |      |      | 30%  | 21%  | 4.4%      |    | 0               | 33    | 33 |  |
|                     |            |            |      |      |    |      |      |           |      |      |      |      |      |            |    |      |    |      |      |           |      |      |      |      |      |           |    |                 |       |    |  |

|            |                                  |
|------------|----------------------------------|
| Study Name | 9th & Grand                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM |
| End Date   | Thursday, April 27, 2023 6:45 PM |
| Site Code  |                                  |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

Traffic Study

|                           |                                                           |          |  |
|---------------------------|-----------------------------------------------------------|----------|--|
| Start Date                | Tuesday, April 25, 2023 11:00 AM                          |          |  |
| End Date                  | Thursday, April 27, 2023 6:45 PM                          |          |  |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |          |  |
| 04/25/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |          |  |
| 04/25/2023 PM Peaks       | 12:30 PM - 1:30 PM                                        |          |  |
| 04/25/2023 PM Peaks       | 4:45 PM - 5:45 PM                                         |          |  |
| 04/27/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |          |  |
| 04/27/2023 PM Peaks       | 12:45 PM - 1:45 PM                                        | 2014 DHV |  |
| 04/27/2023 PM Peaks       | 4:45 PM - 5:45 PM                                         | 2719 SHV |  |





|            |                                  |
|------------|----------------------------------|
| Study Name | 9th & Grand                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM |
| End Date   | Thursday, April 27, 2023 6:45 PM |
| Site Code  |                                  |

Report Summary

|                     |            | Southbound |      |      |      |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |   |                 |       |    |  |
|---------------------|------------|------------|------|------|------|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|---|-----------------|-------|----|--|
| Time Period         | Class.     | R          | T    | L    | U    | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     |   | s on Credestria | Total |    |  |
| Peak 1              | Lights     | 22         | 647  | 10   | 0    | 679  | 651  | 37        | 17   | 15   | 0  | 69   | 19   | 1          | 603  | 24   | 0  | 628  | 721  | 59        | 8    | 11   | 0  | 78   | 63   | 1454      | N | 0               | 6     | 6  |  |
| Specified Period    | %          | 96%        | 94%  | 100% | 0%   | 95%  | 93%  | 97%       | 100% | 94%  | 0% | 97%  | 100% | 100%       | 93%  | 83%  | 0% | 92%  | 94%  | 91%       | 100% | 92%  | 0% | 92%  | 91%  | 94%       |   | 0%              | 100%  |    |  |
| 11:00 AM - 12:00 PM | Buses      | 1          | 4    | 0    | 0    | 5    | 3    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 3    | 4    | 0  | 7    | 7    | 3         | 0    | 0    | 0  | 3    | 5    | 15        | E | 0               | 33    | 33 |  |
| One Hour Peak       | %          | 4%         | 1%   | 0%   | 0%   | 1%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 14%  | 0% | 1%   | 1%   | 5%        | 0%   | 0%   | 0% | 4%   | 7%   | 1%        |   | 0%              | 100%  |    |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 34   | 0    | 0    | 34   | 46   | 1         | 0    | 1    | 0  | 2    | 0    | 0          | 44   | 1    | 0  | 45   | 38   | 3         | 0    | 1    | 0  | 4    | 1    | 85        | S | 0               | 7     | 7  |  |
|                     | %          | 0%         | 5%   | 0%   | 0%   | 5%   | 7%   | 3%        | 0%   | 6%   | 0% | 3%   | 0%   | 0%         | 7%   | 3%   | 0% | 7%   | 5%   | 5%        | 0%   | 8%   | 0% | 5%   | 1%   | 5%        |   | 0%              | 100%  |    |  |
|                     | Total      | 23         | 685  | 10   | 0    | 718  | 700  | 38        | 17   | 16   | 0  | 71   | 19   | 1          | 650  | 29   | 0  | 680  | 766  | 65        | 8    | 12   | 0  | 85   | 69   | 1554      | W | 0               | 8     | 8  |  |
|                     | PHF        | 0.82       | 0.86 | 0.62 | 0    | 0.87 | 0.94 | 0.73      | 0.71 | 0.67 | 0  | 0.85 | 0.59 | 0.25       | 0.96 | 0.56 | 0  | 0.95 | 0.86 | 0.77      | 0.5  | 0.5  | 0  | 0.82 | 0.69 | 0.92      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |      | 46%  | 45%  |           |      |      |    | 5%   | 1%   |            |      |      |    | 44%  | 49%  |           |      |      |    | 5%   | 4%   |           |   | 0               | 54    | 54 |  |
| Peak 2              | Lights     | 22         | 684  | 9    | 0    | 715  | 566  | 64        | 36   | 31   | 0  | 131  | 19   | 0          | 478  | 11   | 0  | 489  | 775  | 60        | 10   | 24   | 0  | 94   | 69   | 1429      | N | 0               | 17    | 17 |  |
| Specified Period    | %          | 92%        | 96%  | 100% | 0%   | 95%  | 93%  | 100%      | 100% | 97%  | 0% | 99%  | 100% | 0%         | 92%  | 65%  | 0% | 91%  | 95%  | 94%       | 100% | 92%  | 0% | 94%  | 90%  | 94%       |   | 0%              | 100%  |    |  |
| 12:00 PM - 1:45 PM  | Buses      | 0          | 3    | 0    | 0    | 3    | 4    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 3    | 6    | 0  | 9    | 7    | 4         | 0    | 1    | 0  | 5    | 6    | 17        | E | 0               | 28    | 28 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0%   | 0%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 35%  | 0% | 2%   | 1%   | 6%        | 0%   | 4%   | 0% | 5%   | 8%   | 1%        |   | 0%              | 100%  |    |  |
| 12:30 PM - 1:30 PM  | Trucks     | 2          | 29   | 0    | 0    | 31   | 39   | 0         | 0    | 1    | 0  | 1    | 0    | 0          | 38   | 0    | 0  | 38   | 30   | 0         | 0    | 1    | 0  | 1    | 2    | 71        | S | 0               | 8     | 8  |  |
|                     | %          | 8%         | 4%   | 0%   | 0%   | 4%   | 6%   | 0%        | 0%   | 3%   | 0% | 1%   | 0%   | 0%         | 7%   | 0%   | 0% | 7%   | 4%   | 0%        | 0%   | 4%   | 0% | 1%   | 3%   | 5%        |   | 0%              | 100%  |    |  |
|                     | Total      | 24         | 716  | 9    | 0    | 749  | 609  | 64        | 36   | 32   | 0  | 132  | 19   | 0          | 519  | 17   | 0  | 536  | 812  | 64        | 10   | 26   | 0  | 100  | 77   | 1517      | W | 0               | 13    | 13 |  |
|                     | PHF        | 0.67       | 0.93 | 0.45 | 0    | 0.92 | 0.94 | 0.8       | 0.75 | 0.8  | 0  | 0.89 | 0.68 | 0          | 0.93 | 0.61 | 0  | 0.91 | 0.93 | 0.7       | 0.62 | 0.81 | 0  | 0.71 | 0.71 | 0.98      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |      | 49%  | 40%  |           |      |      |    | 9%   | 1%   |            |      |      |    | 35%  | 54%  |           |      |      |    | 7%   | 5%   |           |   | 0               | 66    | 66 |  |
| Peak 3              | Lights     | 19         | 624  | 22   | 1    | 666  | 1744 | 90        | 19   | 22   | 0  | 131  | 53   | 20         | 1609 | 38   | 0  | 1667 | 696  | 50        | 11   | 44   | 0  | 105  | 76   | 2569      | N | 1               | 14    | 15 |  |
| Specified Period    | %          | 90%        | 99%  | 100% | 100% | 99%  | 99%  | 100%      | 100% | 100% | 0% | 100% | 100% | 100%       | 99%  | 88%  | 0% | 99%  | 98%  | 91%       | 100% | 98%  | 0% | 95%  | 92%  | 98%       |   | 7%              | 93%   |    |  |
| 4:00 PM - 6:45 PM   | Buses      | 1          | 3    | 0    | 0    | 4    | 0    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 0    | 5    | 0  | 5    | 8    | 5         | 0    | 0    | 0  | 5    | 6    | 14        | E | 0               | 11    | 11 |  |
| One Hour Peak       | %          | 5%         | 0%   | 0%   | 0%   | 1%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 12%  | 0% | 0%   | 1%   | 9%        | 0%   | 0%   | 0% | 5%   | 7%   | 1%        |   | 0%              | 100%  |    |  |
| 4:45 PM - 5:45 PM   | Trucks     | 1          | 5    | 0    | 0    | 6    | 20   | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 19   | 0    | 0  | 19   | 5    | 0         | 0    | 1    | 0  | 1    | 1    | 26        | S | 0               | 10    | 10 |  |
|                     | %          | 5%         | 1%   | 0%   | 0%   | 1%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 0%   | 0% | 1%   | 1%   | 0%        | 0%   | 2%   | 0% | 1%   | 1%   | 1%        |   | 0%              | 100%  |    |  |
|                     | Total      | 21         | 632  | 22   | 1    | 676  | 1764 | 90        | 19   | 22   | 0  | 131  | 53   | 20         | 1628 | 43   | 0  | 1691 | 709  | 55        | 11   | 45   | 0  | 111  | 83   | 2609      | W | 0               | 6     | 6  |  |
|                     | PHF        | 0.66       | 0.93 | 0.69 | 0.25 | 0.92 | 0.93 | 0.73      | 0.68 | 0.61 | 0  | 0.73 | 0.63 | 0.71       | 0.93 | 0.83 | 0  | 0.94 | 0.95 | 0.76      | 0.46 | 0.75 | 0  | 0.87 | 0.86 | 0.93      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |      | 26%  | 68%  |           |      |      |    | 5%   | 2%   |            |      |      |    | 65%  | 27%  |           |      |      |    | 4%   | 3%   |           |   | 1               | 41    | 42 |  |
|                     |            |            |      |      |      |      |      |           |      |      |    |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |   |                 |       |    |  |

|            |                                  |
|------------|----------------------------------|
| Study Name | 9th & Grand                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM |
| End Date   | Thursday, April 27, 2023 6:45 PM |
| Site Code  |                                  |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |   |                 |       |    |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|---|-----------------|-------|----|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     |   | s on Credestria | Total |    |
| Peak 1              | Lights     | 23         | 701  | 13   | 0  | 737  | 791  | 23        | 11   | 24   | 0  | 58   | 53   | 33         | 754  | 66   | 0  | 853  | 775  | 50        | 7    | 14   | 0  | 71   | 100  | 1719      | N | 0               | 26    | 26 |
| Specified Period    | %          | 100%       | 94%  | 100% | 0% | 94%  | 94%  | 92%       | 100% | 100% | 0% | 97%  | 98%  | 97%        | 94%  | 96%  | 0% | 94%  | 94%  | 91%       | 100% | 100% | 0% | 93%  | 97%  | 94%       |   | 0%              | 100%  |    |
| 11:00 AM - 12:00 PM | Buses      | 0          | 2    | 0    | 0  | 2    | 3    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 3    | 3    | 0  | 6    | 5    | 3         | 0    | 0    | 0  | 3    | 3    | 11        | E | 0               | 20    | 20 |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 4%   | 0% | 1%   | 1%   | 5%        | 0%   | 0%   | 0% | 4%   | 3%   | 1%        |   | 0%              | 100%  |    |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 46   | 0    | 0  | 46   | 48   | 2         | 0    | 0    | 0  | 2    | 1    | 1          | 46   | 0    | 0  | 47   | 48   | 2         | 0    | 0    | 0  | 2    | 0    | 97        | S | 0               | 10    | 10 |
|                     | %          | 0%         | 6%   | 0%   | 0% | 6%   | 6%   | 8%        | 0%   | 0%   | 0% | 3%   | 2%   | 3%         | 6%   | 0%   | 0% | 5%   | 6%   | 4%        | 0%   | 0%   | 0% | 3%   | 0%   | 5%        |   | 0%              | 100%  |    |
|                     | Total      | 23         | 749  | 13   | 0  | 785  | 842  | 25        | 11   | 24   | 0  | 60   | 54   | 34         | 803  | 69   | 0  | 906  | 828  | 55        | 7    | 14   | 0  | 76   | 103  | 1827      | W | 0               | 17    | 17 |
|                     | PHF        | 0.64       | 0.97 | 0.65 | 0  | 0.97 | 0.94 | 0.69      | 0.46 | 0.86 | 0  | 0.68 | 0.84 | 0.85       | 0.96 | 0.66 | 0  | 0.92 | 0.97 | 0.81      | 0.58 | 0.7  | 0  | 0.86 | 0.7  | 0.93      |   | 0%              | 100%  |    |
|                     | Approach % |            |      |      |    | 43%  | 46%  |           |      |      |    | 3%   | 3%   |            |      |      |    | 50%  | 45%  |           |      |      |    | 4%   | 6%   |           |   | 0               | 73    | 73 |
| Peak 2              | Lights     | 29         | 766  | 15   | 0  | 810  | 907  | 34        | 8    | 27   | 0  | 69   | 50   | 25         | 842  | 58   | 0  | 925  | 848  | 55        | 10   | 31   | 0  | 96   | 95   | 1900      | N | 1               | 28    | 29 |
| Specified Period    | %          | 100%       | 94%  | 94%  | 0% | 95%  | 94%  | 100%      | 100% | 100% | 0% | 100% | 94%  | 93%        | 94%  | 91%  | 0% | 94%  | 94%  | 93%       | 100% | 100% | 0% | 96%  | 94%  | 94%       |   | 3%              | 97%   |    |
| 12:00 PM - 1:45 PM  | Buses      | 0          | 2    | 0    | 0  | 2    | 6    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 6    | 6    | 0  | 12   | 6    | 4         | 0    | 0    | 0  | 4    | 6    | 18        | E | 0               | 23    | 23 |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 9%   | 0% | 1%   | 1%   | 7%        | 0%   | 0%   | 0% | 4%   | 6%   | 1%        |   | 0%              | 100%  |    |
| 12:15 PM - 1:15 PM  | Trucks     | 0          | 44   | 1    | 0  | 45   | 49   | 0         | 0    | 0    | 0  | 0    | 3    | 2          | 49   | 0    | 0  | 51   | 44   | 0         | 0    | 0    | 0  | 0    | 0    | 96        | S | 1               | 5     | 6  |
|                     | %          | 0%         | 5%   | 6%   | 0% | 5%   | 5%   | 0%        | 0%   | 0%   | 0% | 0%   | 6%   | 7%         | 5%   | 0%   | 0% | 5%   | 5%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 5%        |   | 17%             | 83%   |    |
|                     | Total      | 29         | 812  | 16   | 0  | 857  | 962  | 34        | 8    | 27   | 0  | 69   | 53   | 27         | 897  | 64   | 0  | 988  | 898  | 59        | 10   | 31   | 0  | 100  | 101  | 2014      | W | 0               | 18    | 18 |
|                     | PHF        | 0.6        | 0.85 | 0.8  | 0  | 0.85 | 0.95 | 0.85      | 0.67 | 0.61 | 0  | 0.72 | 0.83 | 0.56       | 0.93 | 0.67 | 0  | 0.95 | 0.85 | 0.82      | 0.5  | 0.7  | 0  | 0.86 | 0.87 | 0.93      |   | 0%              | 100%  |    |
|                     | Approach % |            |      |      |    | 43%  | 48%  |           |      |      |    | 3%   | 3%   |            |      |      |    | 49%  | 45%  |           |      |      |    | 5%   | 5%   | 5.7%      |   | 2               | 74    | 76 |
| Peak 3              | Lights     | 20         | 766  | 22   | 0  | 808  | 1701 | 85        | 15   | 28   | 0  | 128  | 47   | 14         | 1573 | 39   | 0  | 1626 | 837  | 43        | 11   | 43   | 0  | 97   | 74   | 2659      | N | 1               | 20    | 21 |
| Specified Period    | %          | 91%        | 98%  | 100% | 0% | 98%  | 98%  | 100%      | 100% | 97%  | 0% | 99%  | 100% | 100%       | 98%  | 95%  | 0% | 98%  | 98%  | 91%       | 100% | 98%  | 0% | 95%  | 95%  | 98%       |   | 5%              | 95%   |    |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 3    | 0    | 0  | 3    | 13   | 0         | 0    | 1    | 0  | 1    | 0    | 0          | 13   | 2    | 0  | 15   | 7    | 3         | 0    | 0    | 0  | 3    | 2    | 22        | E | 3               | 20    | 23 |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 0%        | 0%   | 3%   | 0% | 1%   | 0%   | 0%         | 1%   | 5%   | 0% | 1%   | 1%   | 6%        | 0%   | 0%   | 0% | 3%   | 3%   | 1%        |   | 13%             | 87%   |    |
| 4:45 PM - 5:45 PM   | Trucks     | 2          | 12   | 0    | 0  | 14   | 23   | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 22   | 0    | 0  | 22   | 13   | 1         | 0    | 1    | 0  | 2    | 2    | 38        | S | 2               | 20    | 22 |
|                     | %          | 9%         | 2%   | 0%   | 0% | 2%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 0%   | 0% | 1%   | 2%   | 2%        | 0%   | 2%   | 0% | 2%   | 3%   | 1%        |   | 9%              | 91%   |    |
|                     | Total      | 22         | 781  | 22   | 0  | 825  | 1737 | 85        | 15   | 29   | 0  | 129  | 47   | 14         | 1608 | 41   | 0  | 1663 | 857  | 47        | 11   | 44   | 0  | 102  | 78   | 2719      | W | 0               | 21    | 21 |
|                     | PHF        | 0.69       | 0.92 | 0.69 | 0  | 0.95 | 0.95 | 0.73      | 0.75 | 0.66 | 0  | 0.77 | 0.78 | 0.58       | 0.92 | 0.85 | 0  | 0.92 | 0.93 | 0.84      | 0.69 | 0.73 | 0  | 0.88 | 0.93 | 0.95      |   | 0%              | 100%  |    |
|                     | Approach % |            |      |      |    | 30%  | 64%  |           |      |      |    | 5%   | 2%   |            |      |      |    | 61%  | 32%  |           |      |      |    | 4%   | 3%   | 2.2%      |   | 6               | 81    | 87 |
|                     |            |            |      |      |    |      |      |           |      |      |    |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |   |                 |       |    |



|            |                                   |
|------------|-----------------------------------|
| Study Name | RFTA Access                       |
| Start Date | Tuesday, April 25, 2023 7:00 AM   |
| End Date   | Wednesday, April 26, 2023 6:30 PM |
| Site Code  |                                   |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

Traffic Study

|                           |                                                           |         |
|---------------------------|-----------------------------------------------------------|---------|
| Start Date                | Tuesday, April 25, 2023 7:00 AM                           |         |
| End Date                  | Wednesday, April 26, 2023 6:30 PM                         |         |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |         |
| 04/25/2023 AM Peaks       | 7:45 AM - 8:45 AM                                         |         |
| 04/26/2023 AM Peaks       | 7:30 AM - 8:30 AM                                         | 157 DHV |
| 04/26/2023 PM Peaks       | 4:00 PM - 5:00 PM                                         | 181 DHV |



Study Name

RFTA Access

Start Date

Tuesday, April 25, 2023 7:00 AM

End Date

Wednesday, April 26, 2023 6:30 PM

Site Code

Report Summary

|                   |            | Southbound |      |      |    |      |      | Westbound |      |     |      |      |      | Northbound |      |      |      |      |     | Eastbound |      |      |    |      |      | Crosswalk |            |           |       |   |  |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|-----|------|------|------|------------|------|------|------|------|-----|-----------|------|------|----|------|------|-----------|------------|-----------|-------|---|--|
| Time Period       | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L   | U    | I    | O    | R          | T    | L    | U    | I    | O   | R         | T    | L    | U  | I    | O    | Total     | Southbound | Westbound | Total |   |  |
| Peak 1            | Lights     | 4          | 4    | 1    | 0  | 9    | 13   | 2         | 16   | 1   | 0    | 19   | 61   | 4          | 5    | 8    | 0    | 17   | 16  | 11        | 56   | 6    | 0  | 73   | 28   | 118       | N          | 0         | 0     | 0 |  |
| Specified Period  | %          | 80%        | 80%  | 100% | 0% | 82%  | 93%  | 100%      | 73%  | 50% | 0%   | 70%  | 87%  | 57%        | 100% | 73%  | 0%   | 68%  | 73% | 85%       | 92%  | 86%  | 0% | 90%  | 74%  | 82%       |            | 0%        | 0%    |   |  |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 5    | 0   | 0    | 5    | 5    | 0          | 0    | 2    | 0    | 2    | 2   | 2         | 5    | 0    | 0  | 7    | 7    | 14        | E          | 0         | 6     | 6 |  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 23%  | 0%  | 0%   | 19%  | 7%   | 0%         | 0%   | 18%  | 0%   | 8%   | 9%  | 15%       | 8%   | 0%   | 0% | 9%   | 18%  | 10%       |            | 0%        | 100%  |   |  |
| 7:45 AM - 8:45 AM | Trucks     | 1          | 1    | 0    | 0  | 2    | 1    | 0         | 1    | 1   | 1    | 3    | 4    | 3          | 0    | 1    | 2    | 6    | 4   | 0         | 0    | 1    | 0  | 1    | 3    | 12        | S          | 0         | 0     | 0 |  |
|                   | %          | 20%        | 20%  | 0%   | 0% | 18%  | 7%   | 0%        | 5%   | 50% | 100% | 11%  | 6%   | 43%        | 0%   | 9%   | 100% | 24%  | 18% | 0%        | 0%   | 14%  | 0% | 1%   | 8%   | 8%        |            | 0%        | 0%    |   |  |
|                   | Total      | 5          | 5    | 1    | 0  | 11   | 14   | 2         | 22   | 2   | 1    | 27   | 70   | 7          | 5    | 11   | 2    | 25   | 22  | 13        | 61   | 7    | 0  | 81   | 38   | 144       | W          | 0         | 1     | 1 |  |
|                   | PHF        | 0.62       | 0.62 | 0.25 | 0  | 0.92 | 0.58 | 0.5       | 0.69 | 0.5 | 0.25 | 0.75 | 0.76 | 0.58       | 0.62 | 0.69 | 0.25 | 0.62 | 0.5 | 0.46      | 0.69 | 0.44 | 0  | 0.75 | 0.86 | 0.9       |            | 0%        | 100%  |   |  |
|                   | Approach % |            |      |      |    | 8%   | 10%  |           |      |     |      | 19%  | 49%  |            |      |      |      | 17%  | 15% |           |      |      |    | 56%  | 26%  |           |            | 0         | 7     | 7 |  |
|                   |            |            |      |      |    |      |      |           |      |     |      |      |      |            |      |      |      |      |     |           |      |      |    |      |      |           |            |           |       |   |  |

Study Name

RFTA Access

Start Date

Tuesday, April 25, 2023 7:00 AM

End Date

Wednesday, April 26, 2023 6:30 PM

Site Code

Report Summary

|                   |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |                 |    |       |    |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|------|------|------|-----------|-----------------|----|-------|----|
| Time Period       | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     | s on Credestria |    | Total |    |
| Peak 1            | Lights     | 2          | 2    | 4    | 0  | 8    | 10   | 3         | 18   | 1    | 0  | 22   | 76   | 1          | 0    | 11   | 0  | 12   | 18   | 15        | 71   | 7    | 0    | 93   | 31   | 135       | N               | 0  | 0     | 0  |
| Specified Period  | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 100%      | 72%  | 25%  | 0% | 69%  | 93%  | 33%        | 0%   | 69%  | 0% | 63%  | 82%  | 94%       | 95%  | 100% | 0%   | 95%  | 72%  | 86%       |                 | 0% | 0%    |    |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 7    | 1    | 0  | 8    | 6    | 2          | 0    | 4    | 0  | 6    | 2    | 1         | 4    | 0    | 0    | 5    | 11   | 19        | E               | 0  | 6     | 6  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 28%  | 25%  | 0% | 25%  | 7%   | 67%        | 0%   | 25%  | 0% | 32%  | 9%   | 6%        | 5%   | 0%   | 0%   | 5%   | 26%  | 12.1%     |                 | 0% | 100%  |    |
| 7:30 AM - 8:30 AM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 2    | 0  | 2    | 0    | 0          | 0    | 1    | 0  | 1    | 2    | 0         | 0    | 0    | 0    | 0    | 1    | 3         | S               | 0  | 0     | 0  |
| Pedestrians       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 50%  | 0% | 6%   | 0%   | 0%         | 0%   | 6%   | 0% | 5%   | 9%   | 0%        | 0%   | 0%   | 0%   | 0%   | 2%   | 1.9%      |                 | 0% | 0%    |    |
| 13                | Total      | 2          | 2    | 4    | 0  | 8    | 10   | 3         | 25   | 4    | 0  | 32   | 82   | 3          | 0    | 16   | 0  | 19   | 22   | 16        | 75   | 7    | 0    | 98   | 43   | 157       | W               | 0  | 0     | 0  |
|                   | PHF        | 0.5        | 0.25 | 0.33 | 0  | 0.5  | 0.62 | 0.75      | 0.69 | 0.5  | 0  | 0.8  | 0.85 | 0.38       | 0    | 0.8  | 0  | 0.68 | 0.69 | 0.5       | 0.78 | 0.58 | 0    | 0.84 | 0.72 | 0.91      |                 | 0% | 0%    |    |
|                   | Approach % |            |      |      |    | 5%   | 6%   |           |      |      |    | 20%  | 52%  |            |      |      |    | 12%  | 14%  |           |      |      |      | 62%  | 27%  | 14.0%     |                 | 0  | 6     | 6  |
| Peak 2            | Lights     | 12         | 2    | 12   | 0  | 26   | 6    | 0         | 45   | 1    | 0  | 46   | 81   | 4          | 3    | 15   | 0  | 22   | 7    | 4         | 65   | 3    | 1    | 73   | 73   | 167       | N               | 0  | 3     | 3  |
| Specified Period  | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 0%        | 88%  | 100% | 0% | 88%  | 95%  | 100%       | 100% | 88%  | 0% | 92%  | 78%  | 67%       | 94%  | 100% | 100% | 92%  | 90%  | 92%       |                 | 0% | 100%  |    |
| 4:00 PM - 6:30 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 6    | 0    | 0  | 6    | 4    | 0          | 0    | 2    | 0  | 2    | 2    | 2         | 4    | 0    | 0    | 6    | 8    | 14        | E               | 0  | 2     | 2  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 12%  | 0%   | 0% | 12%  | 5%   | 0%         | 0%   | 12%  | 0% | 8%   | 22%  | 33%       | 6%   | 0%   | 0%   | 8%   | 10%  | 7.7%      |                 | 0% | 100%  |    |
| 4:00 PM - 5:00 PM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 0         | S               | 0  | 0     | 0  |
| Pedestrians       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 0.0%      |                 | 0% | 0%    |    |
| 14                | Total      | 12         | 2    | 12   | 0  | 26   | 6    | 0         | 51   | 1    | 0  | 52   | 85   | 4          | 3    | 17   | 0  | 24   | 9    | 6         | 69   | 3    | 1    | 79   | 81   | 181       | W               | 0  | 9     | 9  |
|                   | PHF        | 0.5        | 0.5  | 0.3  | 0  | 0.38 | 0.75 | 0         | 0.85 | 0.25 | 0  | 0.87 | 0.76 | 0.5        | 0.75 | 0.85 | 0  | 0.86 | 0.75 | 0.75      | 0.78 | 0.75 | 0.25 | 0.86 | 0.84 | 0.85      |                 | 0% | 100%  |    |
|                   | Approach % |            |      |      |    | 14%  | 3%   |           |      |      |    | 29%  | 47%  |            |      |      |    | 13%  | 5%   |           |      |      |      | 44%  | 45%  | 7.7%      |                 | 0  | 14    | 14 |

|            |                                   |
|------------|-----------------------------------|
| Study Name | W Wulfsohn & Midland Ave          |
| Start Date | Tuesday, April 25, 2023 7:00 AM   |
| End Date   | Wednesday, April 26, 2023 6:30 PM |
| Site Code  |                                   |

## Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

## Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

## Traffic Study

|                           |                                                           |          |
|---------------------------|-----------------------------------------------------------|----------|
| Start Date                | Tuesday, April 25, 2023 7:00 AM                           |          |
| End Date                  | Wednesday, April 26, 2023 6:30 PM                         |          |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |          |
| 04/25/2023 AM Peaks       | 7:00 AM - 8:00 AM                                         |          |
| 04/25/2023 PM Peaks       | 4:00 PM - 5:00 PM                                         |          |
| 04/26/2023 AM Peaks       | 7:00 AM - 8:00 AM                                         | 969 DHV  |
| 04/26/2023 PM Peaks       | 4:00 PM - 5:00 PM                                         | 1309 DHV |



Study Name

W Wulfsohn & Midland Ave

Start Date

Tuesday, April 25, 2023 7:00 AM

End Date

Wednesday, April 26, 2023 6:30 PM

Site Code

Report Summary

|                   |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |      |      |      |      |      | Eastbound |      |      |      |      |      | Crosswalk |   |                 |       |   |  |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|------|------|------|------|------|-----------|------|------|------|------|------|-----------|---|-----------------|-------|---|--|
| Time Period       | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T    | L    | U    | I    | O    | R         | T    | L    | U    | I    | O    | Total     |   | s on Credestria | Total |   |  |
| Peak 1            | Lights     | 5          | 1    | 12   | 0  | 18   | 39   | 13        | 233  | 5    | 0    | 251  | 584  | 10         | 1    | 22   | 0    | 33   | 58   | 52        | 562  | 25   | 1    | 640  | 261  | 942       | N | 0               | 0     | 0 |  |
| Specified Period  | %          | 83%        | 100% | 92%  | 0% | 90%  | 95%  | 93%       | 98%  | 100% | 0%   | 98%  | 97%  | 100%       | 100% | 81%  | 0%   | 85%  | 95%  | 96%       | 97%  | 96%  | 100% | 97%  | 96%  | 97%       |   | 0%              | 0%    |   |  |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 3    | 0    | 0    | 3    | 8    | 0          | 0    | 4    | 1    | 5    | 3    | 2         | 8    | 0    | 0    | 10   | 7    | 18        | E | 0               | 0     | 0 |  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 1%   | 0%         | 0%   | 15%  | 100% | 13%  | 5%   | 4%        | 1%   | 0%   | 0%   | 2%   | 3%   | 2%        |   | 0%              | 0%    |   |  |
| 7:00 AM - 8:00 AM | Trucks     | 1          | 0    | 1    | 0  | 2    | 2    | 1         | 2    | 0    | 0    | 3    | 8    | 0          | 0    | 1    | 0    | 1    | 0    | 0         | 7    | 1    | 0    | 8    | 4    | 14        | S | 0               | 0     | 0 |  |
|                   | %          | 17%        | 0%   | 8%   | 0% | 10%  | 5%   | 7%        | 1%   | 0%   | 0%   | 1%   | 1%   | 0%         | 0%   | 4%   | 0%   | 3%   | 0%   | 0%        | 1%   | 4%   | 0%   | 1%   | 1%   | 1%        |   | 0%              | 0%    |   |  |
|                   | Total      | 6          | 1    | 13   | 0  | 20   | 41   | 14        | 238  | 5    | 0    | 257  | 600  | 10         | 1    | 27   | 1    | 39   | 61   | 54        | 577  | 26   | 1    | 658  | 272  | 974       | W | 0               | 0     | 0 |  |
|                   | PHF        | 0.5        | 0.25 | 0.81 | 0  | 0.71 | 0.68 | 0.7       | 0.75 | 0.62 | 0    | 0.77 | 0.72 | 0.62       | 0.25 | 0.75 | 0.25 | 0.89 | 0.76 | 0.75      | 0.72 | 0.65 | 0.25 | 0.73 | 0.8  | 0.76      |   | 0%              | 0%    |   |  |
|                   | Approach % |            |      |      |    | 2%   | 4%   |           |      |      |      | 26%  | 62%  |            |      |      |      | 4%   | 6%   |           |      |      |      | 68%  | 28%  |           |   | 0               | 0     | 0 |  |
| Peak 2            | Lights     | 22         | 1    | 10   | 0  | 33   | 23   | 12        | 725  | 1    | 1    | 739  | 323  | 1          | 2    | 64   | 6    | 73   | 64   | 56        | 311  | 9    | 0    | 376  | 811  | 1221      | N | 0               | 0     | 0 |  |
| Specified Period  | %          | 96%        | 100% | 100% | 0% | 97%  | 96%  | 100%      | 99%  | 100% | 100% | 99%  | 99%  | 100%       | 67%  | 93%  | 100% | 92%  | 96%  | 95%       | 99%  | 100% | 0%   | 98%  | 98%  | 98%       |   | 0%              | 0%    |   |  |
| 4:00 PM - 6:45 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 1    | 0         | 1    | 0    | 0    | 1    | 3    | 0          | 1    | 5    | 0    | 6    | 2    | 2         | 3    | 0    | 0    | 5    | 6    | 12        | E | 0               | 0     | 0 |  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 4%   | 0%        | 0%   | 0%   | 0%   | 0%   | 1%   | 0%         | 33%  | 7%   | 0%   | 8%   | 3%   | 3%        | 1%   | 0%   | 0%   | 1%   | 1%   | 1%        |   | 0%              | 0%    |   |  |
| 4:00 PM - 5:00 PM | Trucks     | 1          | 0    | 0    | 0  | 1    | 0    | 0         | 6    | 0    | 0    | 6    | 0    | 0          | 0    | 0    | 0    | 0    | 1    | 1         | 0    | 0    | 0    | 1    | 7    | 8         | S | 1               | 1     | 2 |  |
|                   | %          | 4%         | 0%   | 0%   | 0% | 3%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 0%   | 0%   | 0%   | 1%   | 2%        | 0%   | 0%   | 0%   | 0%   | 1%   | 1%        |   | 50%             | 50%   |   |  |
|                   | Total      | 23         | 1    | 10   | 0  | 34   | 24   | 12        | 732  | 1    | 1    | 746  | 326  | 1          | 3    | 69   | 6    | 79   | 67   | 59        | 314  | 9    | 0    | 382  | 824  | 1241      | W | 1               | 0     | 1 |  |
|                   | PHF        | 0.57       | 0.25 | 0.62 | 0  | 0.61 | 0.46 | 0.38      | 0.83 | 0.25 | 0.25 | 0.83 | 0.88 | 0.25       | 0.75 | 0.78 | 0.38 | 0.82 | 0.84 | 0.78      | 0.86 | 0.56 | 0    | 0.85 | 0.85 | 0.89      |   | 100%            | 0%    |   |  |
|                   | Approach % |            |      |      |    | 3%   | 2%   |           |      |      |      | 60%  | 26%  |            |      |      |      | 6%   | 5%   |           |      |      |      | 31%  | 66%  |           |   | 2               | 1     | 3 |  |

Study Name

W Wulfsohn & Midland Ave

Start Date

Tuesday, April 25, 2023 7:00 AM

End Date

Wednesday, April 26, 2023 6:30 PM

Site Code

Report Summary

|                   |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |                 |     |       |   |  |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|------|------|------|-----------|-----------------|-----|-------|---|--|
| Time Period       | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     | s on Credestria |     | Total |   |  |
| Peak 1            | Lights     | 4          | 3    | 2    | 0  | 9    | 34   | 13        | 233  | 1    | 0  | 247  | 584  | 3          | 0    | 22   | 0  | 25   | 61   | 57        | 579  | 21   | 0    | 657  | 259  | 938       | N               | 0   | 0     | 0 |  |
| Specified Period  | %          | 100%       | 100% | 40%  | 0% | 75%  | 100% | 100%      | 98%  | 100% | 0% | 98%  | 97%  | 100%       | 0%   | 76%  | 0% | 78%  | 97%  | 97%       | 98%  | 100% | 0%   | 98%  | 96%  | 97%       |                 | 0%  | 0%    |   |  |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 3    | 0    | 0  | 3    | 5    | 0          | 0    | 6    | 0  | 6    | 1    | 1         | 5    | 0    | 0    | 6    | 9    | 15        | E               | 0   | 0     | 0 |  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 1%   | 0%         | 0%   | 21%  | 0% | 19%  | 2%   | 2%        | 1%   | 0%   | 0%   | 1%   | 3%   | 2%        |                 | 0%  | 0%    |   |  |
| 7:00 AM - 8:00 AM | Trucks     | 0          | 0    | 3    | 0  | 3    | 0    | 0         | 2    | 0    | 0  | 2    | 12   | 0          | 0    | 1    | 0  | 1    | 1    | 1         | 9    | 0    | 0    | 10   | 3    | 16        | S               | 0   | 0     | 0 |  |
| Pedestrians       | %          | 0%         | 0%   | 60%  | 0% | 25%  | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 2%   | 0%         | 0%   | 3%   | 0% | 3%   | 2%   | 2%        | 2%   | 0%   | 0%   | 1%   | 1%   | 1.7%      |                 | 0%  | 0%    |   |  |
| 0                 | Total      | 4          | 3    | 5    | 0  | 12   | 34   | 13        | 238  | 1    | 0  | 252  | 601  | 3          | 0    | 29   | 0  | 32   | 63   | 59        | 593  | 21   | 0    | 673  | 271  | 969       | W               | 0   | 0     | 0 |  |
|                   | PHF        | 1          | 0.38 | 0.42 | 0  | 0.6  | 0.57 | 0.41      | 0.78 | 0.25 | 0  | 0.8  | 0.73 | 0.38       | 0    | 0.66 | 0  | 0.67 | 0.79 | 0.87      | 0.74 | 0.75 | 0    | 0.76 | 0.79 | 0.77      |                 | 0%  | 0%    |   |  |
|                   | Approach % |            |      |      |    | 1%   | 4%   |           |      |      |    | 26%  | 62%  |            |      |      |    | 3%   | 7%   |           |      |      |      | 69%  | 28%  |           |                 | 0   | 0     | 0 |  |
| Peak 2            | Lights     | 28         | 2    | 14   | 0  | 44   | 15   | 10        | 733  | 6    | 0  | 749  | 369  | 1          | 1    | 64   | 0  | 66   | 81   | 73        | 354  | 4    | 1    | 432  | 826  | 1291      | N               | 0   | 0     | 0 |  |
| Specified Period  | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 100%      | 99%  | 100% | 0% | 99%  | 99%  | 100%       | 100% | 96%  | 0% | 96%  | 96%  | 96%       | 99%  | 100% | 100% | 98%  | 99%  | 99%       |                 | 0%  | 0%    |   |  |
| 4:00 PM - 6:30 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0  | 0    | 3    | 0          | 0    | 2    | 0  | 2    | 1    | 1         | 3    | 0    | 0    | 4    | 2    | 6         | E               | 0   | 0     | 0 |  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 1%   | 0%         | 0%   | 3%   | 0% | 3%   | 1%   | 1%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%        |                 | 0%  | 0%    |   |  |
| 4:00 PM - 5:00 PM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 7    | 0    | 0  | 7    | 2    | 0          | 0    | 1    | 0  | 1    | 2    | 2         | 2    | 0    | 0    | 4    | 8    | 12        | S               | 4   | 1     | 5 |  |
| Pedestrians       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 1%   | 0%         | 0%   | 1%   | 0% | 1%   | 2%   | 3%        | 1%   | 0%   | 0%   | 1%   | 1%   | 0.9%      |                 | 80% | 20%   |   |  |
| 7                 | Total      | 28         | 2    | 14   | 0  | 44   | 15   | 10        | 740  | 6    | 0  | 756  | 374  | 1          | 1    | 67   | 0  | 69   | 84   | 76        | 359  | 4    | 1    | 440  | 836  | 1309      | W               | 1   | 1     | 2 |  |
|                   | PHF        | 0.7        | 0.5  | 0.58 | 0  | 0.73 | 0.75 | 0.5       | 0.88 | 0.5  | 0  | 0.88 | 0.91 | 0.25       | 0.25 | 0.88 | 0  | 0.91 | 0.91 | 0.9       | 0.93 | 0.5  | 0.25 | 0.96 | 0.9  | 0.92      |                 | 50% | 50%   |   |  |
|                   | Approach % |            |      |      |    | 3%   | 1%   |           |      |      |    | 58%  | 29%  |            |      |      |    | 5%   | 6%   |           |      |      |      | 34%  | 64%  |           |                 | 5   | 2     | 7 |  |



## Appendix E - COMBINED SCENARIO RESULTS – MOES BY MOVEMENT

| RFTA GMF TIS<br>Operational Result Summary |                      |    |                                         |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |    |
|--------------------------------------------|----------------------|----|-----------------------------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|----|
| Intersection                               | Approach<br>Movement |    | Link/Storage<br>Bay Distance<br>(L_T_R) | 2025 Baseline                |                                |            |              |                     | 2030 Background              |                                |            |              |                     | 2030 Total (6A)              |                                |            |              |                     | 2045 Background              |                                |            |              |                     | 2045 Total (6A)              |                                |            |              |                     |    |
|                                            |                      |    |                                         | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) |    |
| #3 Midland Ave. and<br>Devereux Rd.        | SEB L                | AM | 100                                     | A                            | 0.8                            | A          | 8.2          | 42                  | A                            | 0.8                            | A          | 8.9          | 45                  | A                            | 0.8                            | A          | 9            | 47                  | A                            | 0.8                            | A          | 9            | 46                  | A                            | 0.8                            | A          | 9.1          | 43                  |    |
|                                            |                      | PM |                                         | A                            | 1.6                            | B          | 10.5         | 45                  | A                            | 1.9                            | B          | 11.7         | 49                  | A                            | 1.9                            | B          | 11.8         | 49                  | A                            | 2.1                            | B          | 12.4         | 51                  | A                            | 2.1                            | B          | 12.6         | 51                  |    |
|                                            | SWB L/R              | AM | 814**                                   |                              |                                | C          | 20.2         | 57                  |                              |                                |            | C            | 24.7                | 54                           |                                |            | D            | 25.3                | 70                           |                                |            | D            | 27.9                | 94                           |                                |            | D            | 28.6                | 79 |
|                                            |                      | PM |                                         |                              |                                | C          | 23.7         | 75                  |                              |                                | D          | 34.7         | 100                 |                              |                                | E          | 35.9         | 88                  |                              |                                | E          | 42.4         | 114                 |                              |                                | E          | 45.6         | 118                 |    |
| #20 Wulfsohn Rd. and<br>RFTA / PnR         | EB L                 | AM | 825                                     | A                            | 2.3                            | A          | 7.5          | 5                   | A                            | 1.4                            | A          | 7.9          | 8                   | A                            | 2.1                            | A          | 8            | 12                  | A                            | 1.4                            | A          | 7.9          | 8                   | A                            | 2.1                            | A          | 8            | 15                  |    |
|                                            |                      | PM |                                         | A                            | 2.7                            | A          | 7.3          | 3                   | A                            | 1.6                            | A          | 7.6          | 6                   | A                            | 2.6                            | A          | 7.6          | 11                  | A                            | 1.6                            | A          | 7.6          | 8                   | A                            | 2.6                            | A          | 7.6          | 7                   |    |
|                                            | WB L                 | AM | 1500**                                  |                              |                                | A          | 8            | 13                  |                              |                                | A          | 8.2          | 1874                |                              |                                | A          | 7.9          | 2025                |                              |                                | A          | 8.2          | 2067                |                              |                                | A          | 7.9          | 2053                |    |
|                                            |                      | PM |                                         |                              |                                | A          | 7.4          | 0                   |                              |                                | A          | 7.5          | 965                 |                              |                                | A          | 8.3          | 1294                |                              |                                | A          | 8.3          | 1526                |                              |                                | A          | 8.3          | 1564                |    |
|                                            | NB R                 | AM | 334**                                   |                              |                                | A          | 9.2          | 59                  |                              |                                | A          | 9.6          | 82                  |                              |                                | A          | 9.8          | 341                 |                              |                                | A          | 9.6          | 134                 |                              |                                | A          | 9.8          | 233                 |    |
|                                            |                      | PM |                                         |                              |                                | A          | 8.7          | 21                  |                              |                                | A          | 9            | 20                  |                              |                                | A          | 9.5          | 84                  |                              |                                | A          | 9.8          | 50                  |                              |                                | A          | 9.5          | 191                 |    |
|                                            | NB T/L               | AM | 334**                                   |                              |                                | B          | 10.6         | 30                  |                              |                                | B          | 13.4         | 280                 |                              |                                | C          | 15.2         | 441                 |                              |                                | B          | 13.4         | 218                 |                              |                                | C          | 15.2         | 409                 |    |
|                                            |                      | PM |                                         |                              |                                | A          | 9.9          | 46                  |                              |                                | B          | 11.6         | 165                 |                              |                                | B          | 12.6         | 276                 |                              |                                | B          | 12           | 227                 |                              |                                | B          | 12.6         | 353                 |    |
|                                            | SB                   | AM | 254**                                   |                              |                                | A          | 9.8          | 33                  |                              |                                | B          | 11.8         | 36                  |                              |                                | B          | 12.4         | 71                  |                              |                                | B          | 11.8         | 35                  |                              |                                | B          | 12.4         | 65                  |    |
|                                            |                      | PM |                                         |                              |                                | A          | 9.2          | 44                  |                              |                                | B          | 10.4         | 50                  |                              |                                | B          | 10.9         | 114                 |                              |                                | B          | 10.4         | 59                  |                              |                                | B          | 10.9         | 147                 |    |
|                                            |                      |    |                                         |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |    |
| #4 - Midland Avenue<br>and Wulfsohn Road   | EB L                 | AM | 95_776_25                               | A                            | 1.5                            | A          | 8.2          | 30                  | D                            | 34.6                           | A          | 8.4          | 32                  | E                            | 38.2                           | A          | 8.4          | 34                  | E                            | 41.3                           | A          | 8.5          | 44                  | E                            | 45.6                           | A          | 8.5          | 35                  |    |
|                                            |                      | PM |                                         | A                            | 2.4                            | A          | 9.8          | 14                  | E                            | 40.6                           | B          | 10.5         | 45                  | F                            | 60.5                           | B          | 10.5         | 42                  | F                            | 61.9                           | B          | 10.9         | 42                  | F                            | 74.5                           | B          | 10.9         | 44                  |    |
|                                            | WB L                 | AM | 95_1350                                 |                              |                                | B          | 10.6         | 5                   |                              |                                | B          | 11.1         | 13                  |                              |                                | B          | 12           | 24                  |                              |                                | B          | 11.6         | 11                  |                              |                                | B          | 12.6         | 27                  |    |
|                                            |                      | PM |                                         |                              |                                | A          | 8.5          | 15                  |                              |                                | A          | 8.9          | 20                  |                              |                                | A          | 9.1          | 20                  |                              |                                | A          | 9            | 19                  |                              |                                | A          | 9.2          | 18                  |    |
|                                            | NB                   | AM | 825                                     |                              |                                | D          | 31.4         | 73                  |                              |                                | F          | 283.1        | 993                 |                              |                                | F          | 292.9        | 903                 |                              |                                | F          | 358.5        | 998                 |                              |                                | F          | 369.7        | 902                 |    |
|                                            |                      | PM |                                         |                              |                                | D          | 33.2         | 70                  |                              |                                | F          | 366.8        | 1055                |                              |                                | F          | 479.2        | 1044                |                              |                                | F          | 592.8        | 1014                |                              |                                | F          | 622.7        | 983                 |    |
|                                            | SB T/L               | AM | 327                                     |                              |                                | D          | 28.8         | 51                  |                              |                                | E          | 36.1         | 65                  |                              |                                | D          | 32.7         | 57                  |                              |                                | E          | 40.7         | 69                  |                              |                                | E          | 36.6         | 58                  |    |
|                                            |                      | PM |                                         |                              |                                | C          | 21.8         | 40                  |                              |                                | D          | 32.2         | 76                  |                              |                                | D          | 31.8         | 77                  |                              |                                | E          | 49.6         | 164                 |                              |                                | E          | 35.4         | 89                  |    |
|                                            | SB R                 | AM | 75                                      |                              |                                | B          | 10.6         | 25                  |                              |                                | B          | 11           | 35                  |                              |                                | B          | 11.1         | 37                  |                              |                                | B          | 11.3         | 40                  |                              |                                | B          | 11.3         | 36                  |    |
|                                            |                      | PM |                                         |                              |                                | C          | 17           | 51                  |                              |                                | C          | 20.4         | 73                  |                              |                                | C          | 20           | 76                  |                              |                                | C          | 22.4         | 99                  |                              |                                | C          | 22           | 80                  |    |
|                                            |                      |    |                                         |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |    |
| #13 8th St. and<br>Colorado Ave.           | EB                   | AM | 218                                     | B                            | 11.1                           | B          | 10.3         | 98                  | C                            | 16.3                           | C          | 17.2         | 172                 | C                            | 19.1                           | C          | 20.6         | 241                 | C                            | 18.7                           | C          | 19.7         | 184                 | C                            | 22.4                           | C          | 24           | 229                 |    |
|                                            |                      | PM |                                         | B                            | 10.1                           | B          | 10.6         | 185                 | C                            | 16.2                           | C          | 16.5         | 169                 | C                            | 21.5                           | C          | 23.3         | 221                 | C                            | 18                             | C          | 18.6         | 180                 | D                            | 25.6                           | D          | 28.3         | 240                 |    |
|                                            | WB                   | AM | 226                                     |                              |                                | B          | 12.3         | 138                 |                              |                                | C          | 17.3         | 179                 |                              |                                | C          | 20.3         | 174                 |                              |                                | C          | 20.3         | 180                 |                              |                                | C          | 24.5         | 183                 |    |
|                                            |                      | PM |                                         |                              |                                | B          | 10.1         | 93                  |                              |                                | C          | 17.5         | 169                 |                              |                                | C          | 23.3         | 164                 |                              |                                | C          | 20           | 180                 |                              |                                | D          | 28           | 174                 |    |
|                                            | NB                   | AM | 404                                     |                              |                                | A          | 9.6          | 58                  |                              |                                | B          | 10.7         | 56                  |                              |                                | B          | 11.3         | 70                  |                              |                                | B          | 11.1         | 64                  |                              |                                | B          | 11.7         | 70                  |    |
|                                            |                      | PM |                                         |                              |                                | A          | 9.4          | 78                  |                              |                                | B          | 10.7         | 66                  |                              |                                | B          | 12.1         | 90                  |                              |                                | B          | 11.1         | 67                  |                              |                                | B          | 12.6         | 93                  |    |
|                                            | SB                   | AM | 398                                     |                              |                                | A          | 9.1          | 52                  |                              |                                | B          | 10.2         | 52                  |                              |                                | B          | 10.5         | 60                  |                              |                                | B          | 10.6         | 51                  |                              |                                | B          | 10.9         | 67                  |    |
|                                            |                      | PM |                                         |                              |                                | A          | 9.2          | 65                  |                              |                                | B          | 10.5         | 61                  |                              |                                | B          | 11.2         | 61                  |                              |                                | B          | 10.8         | 60                  |                              |                                | B          | 11.7         | 78                  |    |
|                                            |                      |    |                                         |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |    |
| #15 9th St. and<br>Colorado Ave.           | EB                   | AM | 501                                     | A                            | 8.9                            | A          | 8.1          | 58                  | A                            | 9                              | A          | 8.1          | 56                  | A                            | 9.3                            | A          | 8.2          | 54                  | A                            | 9.3                            | A          | 8.3          | 58                  | A                            | 9.6                            | A          | 8.4          | 55                  |    |
|                                            |                      | PM |                                         | A                            | 8                              | A          | 7.8          | 58                  | A                            | 7.9                            | A          | 7.8          | 51                  | A                            | 8.2                            | A          | 7.9          | 57                  | A                            | 8                              | A          | 7.9          | 65                  | A                            | 8.3                            | A          | 8            | 54                  |    |
|                                            | WB                   | AM | 211                                     |                              |                                | A          | 8            | 65                  |                              |                                | A          | 8            | 69                  |                              |                                | A          | 8.1          | 68                  |                              |                                | A          | 8.2          | 70                  |                              |                                | A          | 8.3          | 77                  |    |
|                                            |                      | PM |                                         |                              |                                | A          | 7.7          | 65                  |                              |                                | A          | 7.7          | 65                  |                              |                                | A          | 7.9          | 80                  |                              |                                | A          | 7.8          | 67                  |                              |                                | A          | 8            | 77                  |    |
|                                            | NB                   | AM | 418                                     |                              |                                | A          | 7.9          | 13                  |                              |                                | A          | 7.9          | 15                  |                              |                                | A          | 7.9          | 13                  |                              |                                | A          | 8            | 21                  |                              |                                | A          | 8            | 21                  |    |
|                                            |                      | PM |                                         |                              |                                | A          | 7.5          | 0                   |                              |                                | A          | 7.5          | 0                   |                              |                                | A          | 7.6          | 0                   |                              |                                | A          | 7.6          | 0                   |                              |                                | A          | 7.7          | 0                   |    |
|                                            | SB                   | AM | 404                                     |                              |                                | A          | 9.6          | 78                  |                              |                                | A          | 9.7          | 78                  |                              |                                | B          | 10.2         | 78                  |                              |                                | B          | 10.1         | 86                  |                              |                                | B          | 10.6         | 87                  |    |
|                                            |                      | PM |                                         |                              |                                | A          | 8.4          | 62                  |                              |                                | A          | 8.3          | 55                  |                              |                                | A          | 8.7          | 65                  |                              |                                | A          | 8.4          | 60                  |                              |                                | A          | 8.8          | 67                  |    |

\*95th percentile queue exceeds link distance  
\*95th percentile queue exceeds storage bay distance  
\*\*Modeled link distance differs from actual link distance

| Unsignalized Intersections |                             |                 |
|----------------------------|-----------------------------|-----------------|
| Level of Service           |                             | Delay (seconds) |
| A                          | (Highly Desirable)          | < 10.0          |
| B                          | (Desirable)                 | 10.1 to 15      |
| C                          | (Acceptable)                | 15.1 to 25      |
| D                          | (Acceptable in Urban Areas) | 25.1 to 35      |
| E                          | (Unacceptable)              | 35.1 to 50      |
| F                          | (Unacceptable)              | > 50            |



| RFTA GMF TIS<br>Operational Result Summary |                      |    |                                         |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |                              |                                |            |              |                     |
|--------------------------------------------|----------------------|----|-----------------------------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|------------------------------|--------------------------------|------------|--------------|---------------------|
| Intersection                               | Approach<br>Movement |    | Link/Storage<br>Bay Distance<br>(L_T_R) | 2025 Baseline                |                                |            |              |                     | 2030 Background              |                                |            |              |                     | 2030 Total (6A)              |                                |            |              |                     | 2045 Background              |                                |            |              |                     | 2045 Total (6A)              |                                |            |              |                     |
|                                            |                      |    |                                         | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) | <u>Overall</u><br><u>LOS</u> | <u>Overall</u><br><u>Delay</u> | <u>LOS</u> | <u>Delay</u> | 95th % Q<br>(L_T_R) |
| #16 9th St. and Grand Ave.                 | EB L                 | AM | 75                                      | A                            | 10                             | D          | 41.9         | 66                  | B                            | 10                             | D          | 41.9         | 64                  | A                            | 9.8                            | D          | 42.3         | 66                  | B                            | 10.7                           | D          | 41.7         | 83                  | B                            | 11.1                           | D          | 41.1         | 71                  |
|                                            |                      | PM |                                         | C                            | 20.5                           | E          | 76.2         | 97                  | C                            | 21.3                           | E          | 76.3         | 95                  | C                            | 22.1                           | E          | 75.6         | 97                  | C                            | 23.7                           | E          | 76.3         | 95                  | C                            | 24.1                           | E          | 75.6         | 98                  |
|                                            | EB T/R               | AM | 211                                     |                              |                                | D          | 45.3         | 81                  |                              |                                | D          | 45.3         | 83                  |                              |                                | D          | 45.3         | 88                  |                              |                                | D          | 45.3         | 122                 |                              |                                | D          | 45.4         | 109                 |
|                                            |                      | PM |                                         |                              |                                | E          | 79.8         | 135                 |                              |                                | E          | 79.8         | 128                 |                              |                                | F          | 80.4         | 138                 |                              |                                | F          | 80.1         | 120                 |                              |                                | F          | 80.7         | 143                 |
|                                            | WB L                 | AM | 75                                      |                              |                                | D          | 43.5         | 63                  |                              |                                | D          | 43.4         | 55                  |                              |                                | D          | 43.4         | 58                  |                              |                                | D          | 43.3         | 73                  |                              |                                | D          | 43.3         | 63                  |
|                                            |                      | PM |                                         |                              |                                | E          | 71.9         | 90                  |                              |                                | E          | 71.9         | 86                  |                              |                                | E          | 71.8         | 98                  |                              |                                | E          | 71.6         | 96                  |                              |                                | E          | 71.5         | 100                 |
|                                            | WB T/R               | AM | 277                                     |                              |                                | D          | 45.2         | 65                  |                              |                                | D          | 45.2         | 60                  |                              |                                | D          | 45.2         | 60                  |                              |                                | D          | 45.2         | 84                  |                              |                                | D          | 45.2         | 64                  |
|                                            |                      | PM |                                         |                              |                                | F          | 90.8         | 192                 |                              |                                | F          | 91.3         | 181                 |                              |                                | F          | 91.9         | 191                 |                              |                                | F          | 95.5         | 177                 |                              |                                | F          | 96.5         | 217                 |
|                                            | NB L                 | AM | 150                                     |                              |                                | A          | 7            | 121                 |                              |                                | B          | 12.3         | 135                 |                              |                                | A          | 7            | 125                 |                              |                                | A          | 7.3          | 131                 |                              |                                | A          | 7.6          | 154                 |
|                                            |                      | PM |                                         |                              |                                | A          | 7.4          | 131                 |                              |                                | A          | 7.7          | 110                 |                              |                                | A          | 8.1          | 160                 |                              |                                | A          | 8.2          | 115                 |                              |                                | A          | 8.7          | 161                 |
|                                            | NB TT/R              | AM | 433_433                                 |                              |                                | B          | 11.8         | 296 250             |                              |                                | B          | 12.2         | 324 257             |                              |                                | B          | 12.1         | 296 232             |                              |                                | B          | 13.4         | 329 276             |                              |                                | B          | 13.9         | 338 282             |
|                                            |                      | PM |                                         |                              |                                | B          | 17           | 535 503             |                              |                                | B          | 18.6         | 531 493             |                              |                                | B          | 19.4         | 558 552             |                              |                                | C          | 21.8         | 552 529             |                              |                                | C          | 22.1         | 533 547             |
|                                            | SB L                 | AM | 125                                     |                              |                                | A          | 8.3          | 50                  |                              |                                | A          | 8.6          | 47                  |                              |                                | A          | 8.4          | 58                  |                              |                                | A          | 9.2          | 66                  |                              |                                | A          | 9.5          | 67                  |
|                                            |                      | PM |                                         |                              |                                | B          | 13.6         | 69                  |                              |                                | B          | 15.6         | 76                  |                              |                                | B          | 16.5         | 80                  |                              |                                | B          | 20           | 77                  |                              |                                | C          | 20.2         | 69                  |
|                                            | SB TT/R              | AM | 412_412                                 |                              |                                | A          | 1.3          | 189 180             |                              |                                | A          | 1.6          | 205 202             |                              |                                | A          | 1.6          | 235 221             |                              |                                | A          | 1.9          | 312 308             |                              |                                | A          | 2            | 275 252             |
|                                            |                      | PM |                                         |                              |                                | B          | 10.7         | 245 236             |                              |                                | B          | 11.1         | 274 270             |                              |                                | B          | 11.6         | 265 254             |                              |                                | B          | 11.9         | 294 286             |                              |                                | B          | 12.3         | 280 268             |

\*95th percentile queue exceeds link distance  
\*95th percentile queue exceeds storage bay distance  
\*\*Modeled link distance differs from actual link distance

| Unsignalized Intersections |                             |                 |
|----------------------------|-----------------------------|-----------------|
| Level of Service           |                             | Delay (seconds) |
| A                          | (Highly Desirable)          | < 10.0          |
| B                          | (Desirable)                 | 10.1 to 15      |
| C                          | (Acceptable)                | 15.1 to 25      |
| D                          | (Acceptable in Urban Areas) | 25.1 to 35      |
| E                          | (Unacceptable)              | 35.1 to 50      |
| F                          | (Unacceptable)              | > 50            |

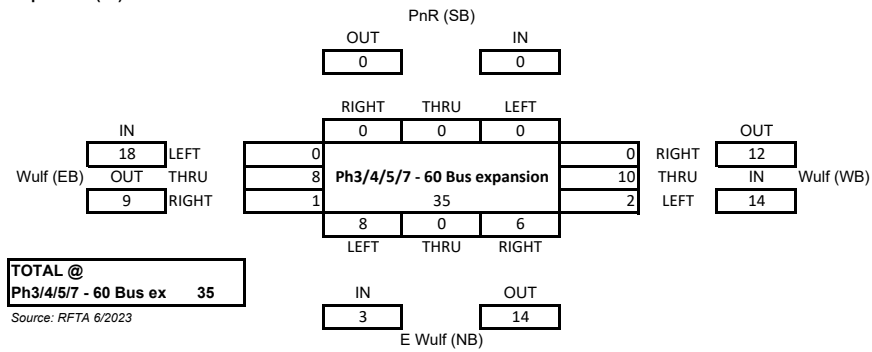
## Appendix F - TRIP GENERATION, REDUCTION, DISTRIBUTION, ASSIGNMENT WORKSHEET

Trip Generation - RFTA GMF  
ITE Trip Generation, 11th Edition

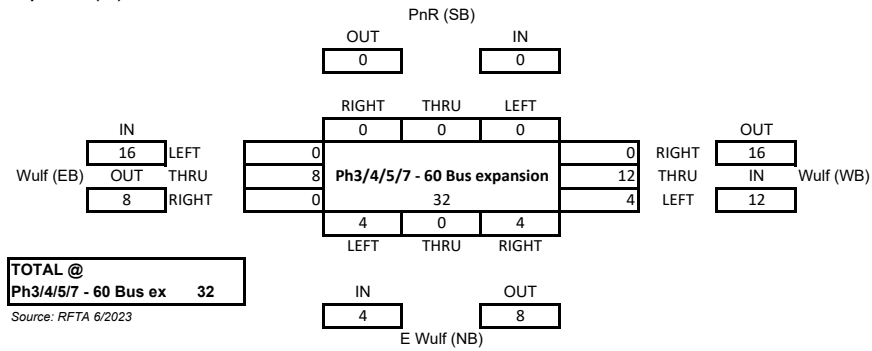
| Land Use                                   | Number of Units | ITE Code | Weekday Rate                                        | AM Rate | Design Hour Rates |            |         |             |            | Weekday Design Hour Traffic |       |        |       |        |
|--------------------------------------------|-----------------|----------|-----------------------------------------------------|---------|-------------------|------------|---------|-------------|------------|-----------------------------|-------|--------|-------|--------|
|                                            |                 |          |                                                     |         | AM Entering       | AM Exiting | PM Rate | PM Entering | PM Exiting | Weekday Traffic             | AM IN | AM OUT | PM IN | PM OUT |
| Ph 3/4/5/7 - General Office Building (ksf) | 9.647           | 710      | 15.76                                               | 2.32    | 1.86              | 0.46       | 2.49    | 0.62        | 1.87       | 152                         | 18    | 4      | 6     | 18     |
| Ph 3/4/5/7 - 60 Bus expansion              |                 | *        | * based on RFTA 60-bus projections (by RFTA 6/2023) |         |                   |            |         |             |            |                             | 3     | 14     | 4     | 8      |
| Ph6A - Park and Ride                       | 22              | 90       | 5.77                                                | 1.09    | 0.96              | 0.13       | 0.64    | 0.11        | 0.53       | 127                         | 21    | 3      | 2     | 12     |
| Total Traffic                              |                 |          |                                                     |         |                   |            |         |             |            | 279                         | 42    | 21     | 12    | 38     |
| Total DHV                                  |                 |          |                                                     |         |                   |            |         |             |            |                             | 63    |        | 50    |        |
| Ph 3/4/5/7 10% Transit Reduction           |                 |          |                                                     |         |                   |            |         |             |            | 137                         | 16    | 4      | 5     | 16     |
| Total Traffic (reduced)                    |                 |          |                                                     |         |                   |            |         |             |            | 264                         | 40    | 21     | 11    | 36     |
| Total DHV (reduced)                        |                 |          |                                                     |         |                   |            |         |             |            |                             | 61    |        | 48    |        |

|                         | ITE Code | Basis of Rate                                       | Time Period Used Above    | Weekday Design Hour Distribution |        |       |        |
|-------------------------|----------|-----------------------------------------------------|---------------------------|----------------------------------|--------|-------|--------|
|                         |          |                                                     |                           | AM IN                            | AM OUT | PM IN | PM OUT |
| General Office Building | 710      | Fitted Curve                                        | Peak Hour adjacent Street | 88%                              | 12%    | 17%   | 83%    |
| 60 Bus expansion        | *        | * based on RFTA 60-bus projections (by RFTA 6/2023) |                           |                                  |        |       |        |
| Park and Ride           | 90       | Fitted Curve                                        | Peak Hour adjacent Street | 80%                              | 20%    | 25%   | 75%    |

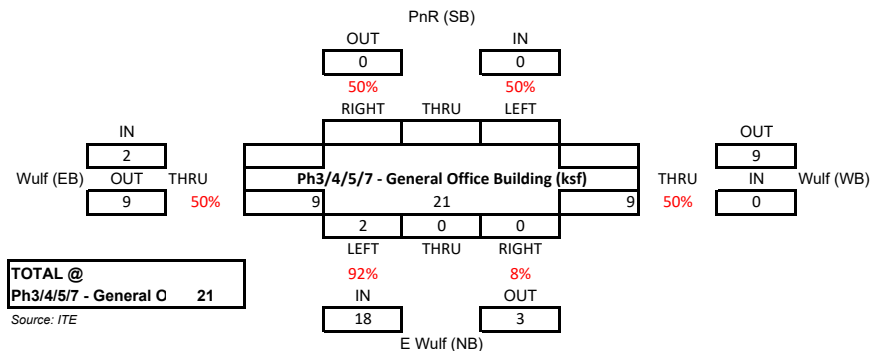
Ph3/4/5/7 - 60 Bus expansion  
AM - Projected Bus traffic increase with expansion (60)



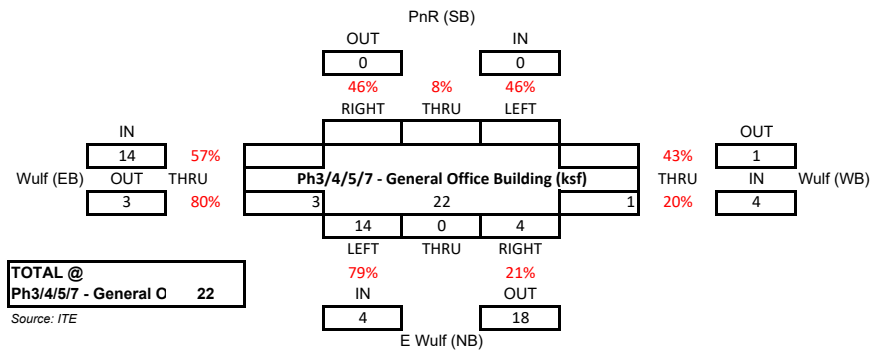
PM - Projected Bus traffic increase with expansion (60)



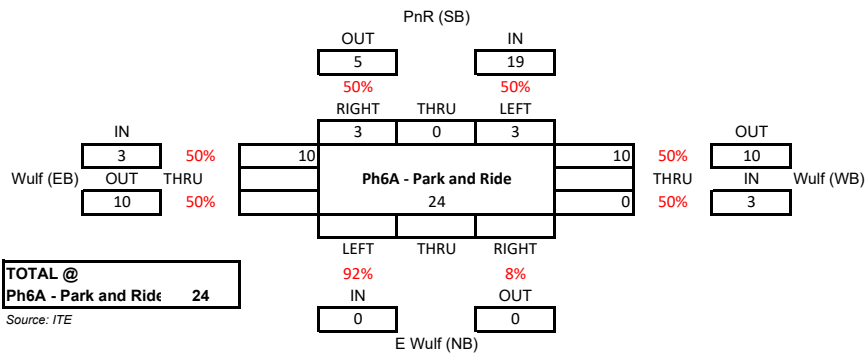
Ph3/4/5/7 - General Office Building (ksf)  
Weekday AM



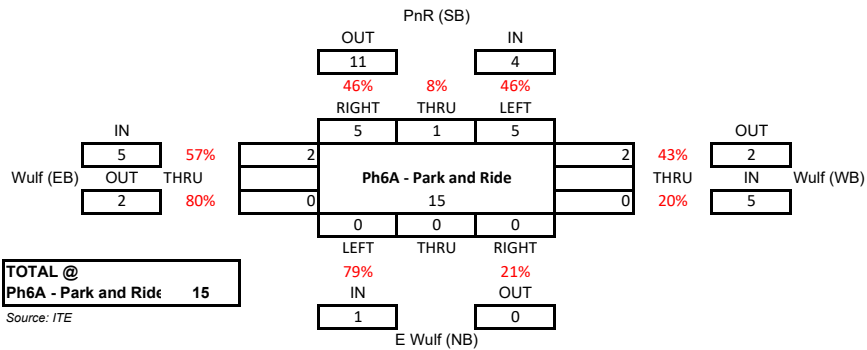
Weekday PM



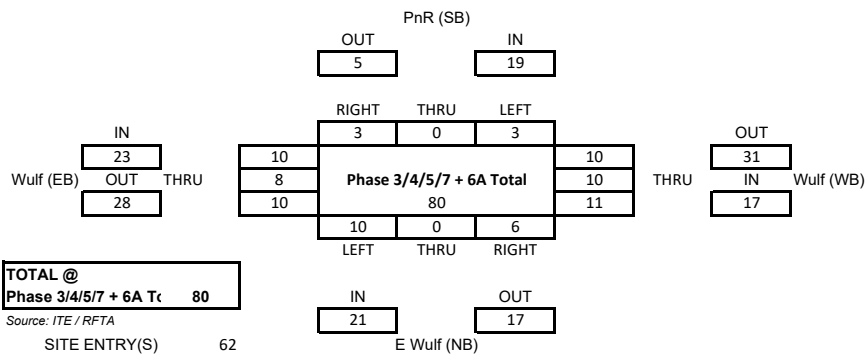
**Ph6A - Park and Ride  
Weekday AM**



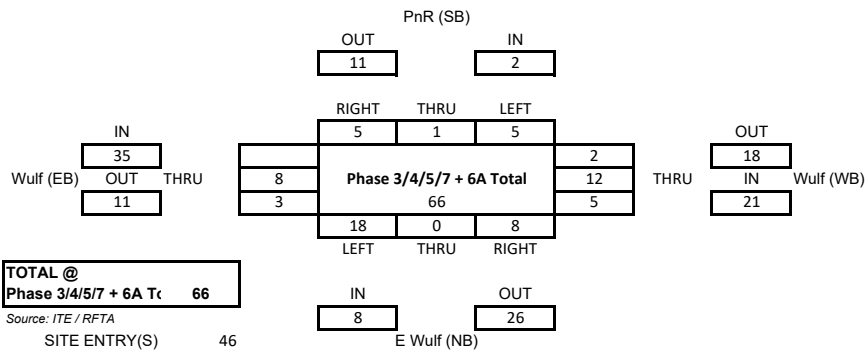
**Weekday PM**



**Phase 3/4/5/7 + 6A Total  
Weekday AM**



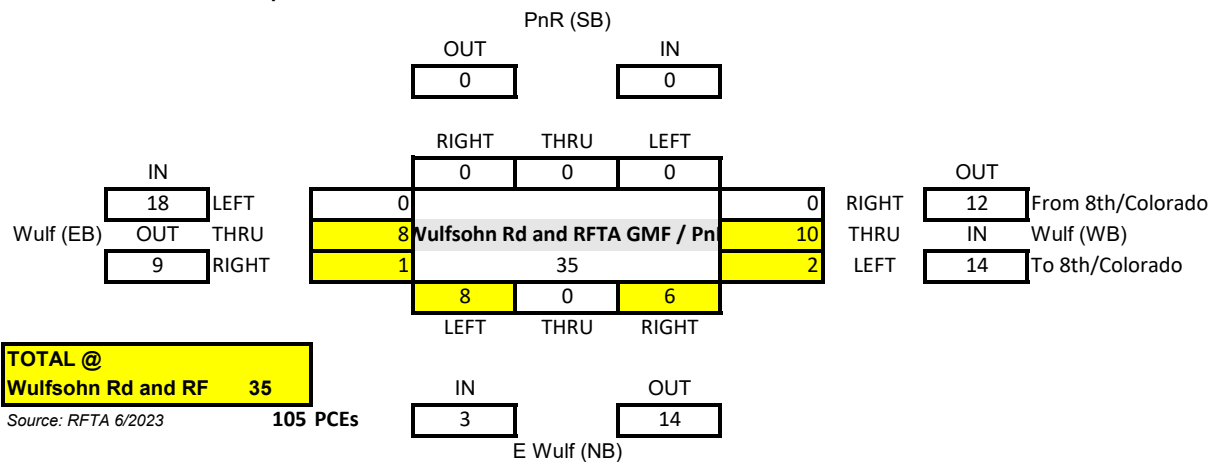
**Weekday PM**



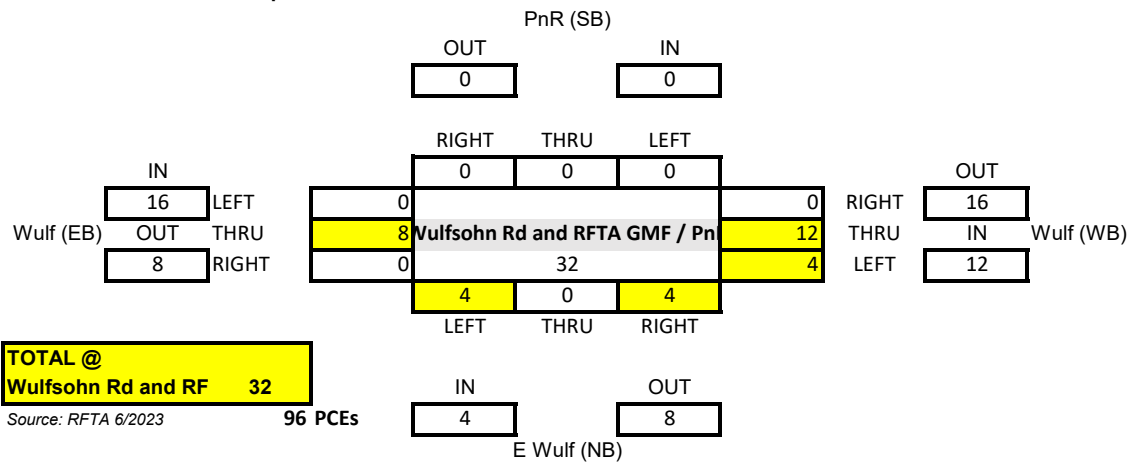


## Wulfsohn Rd and RFTA GMF / PnR

### Projected Bus traffic increase with expansion AM

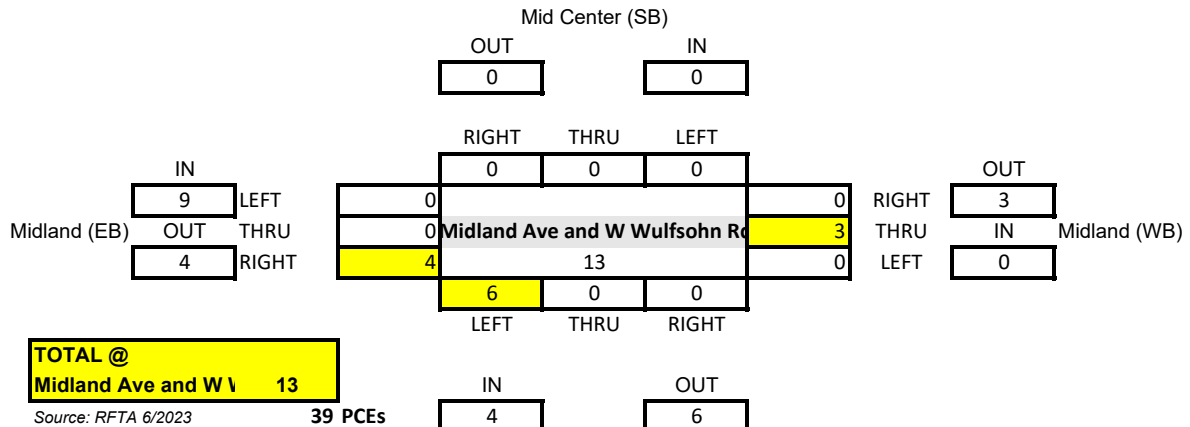


### Projected Bus traffic increase with expansion PM

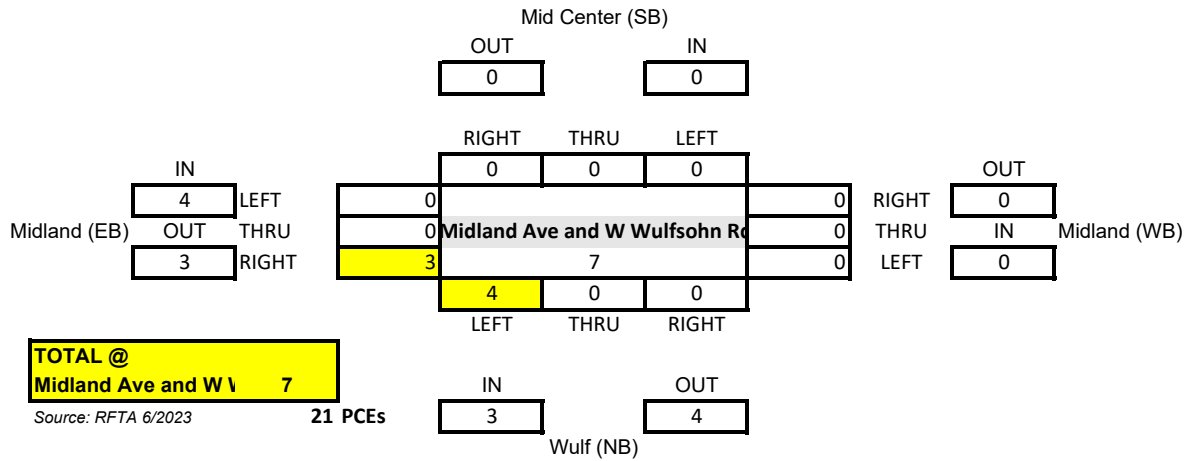


## Midland Ave and W Wulfsohn Rd

### Projected Bus traffic increase with expansion AM

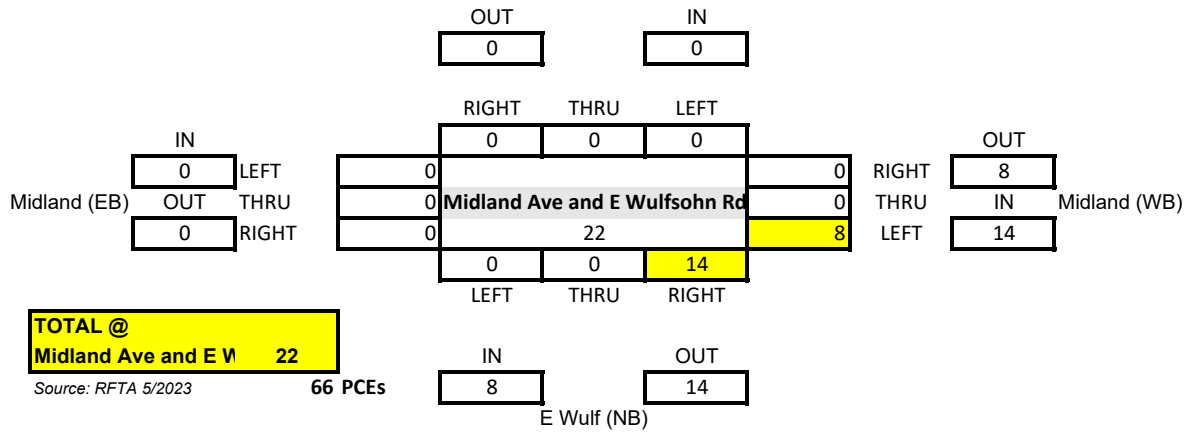


### Projected Bus traffic increase with expansion PM

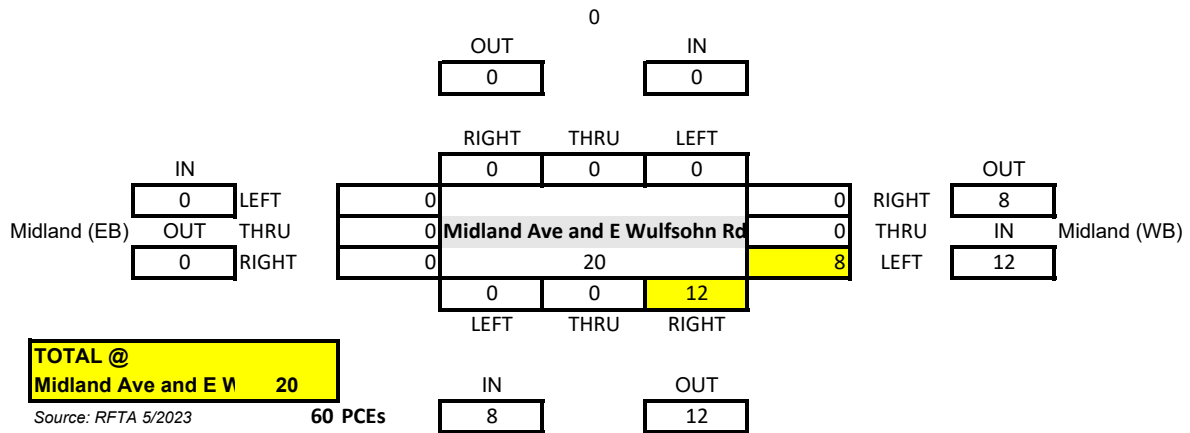


# Midland Ave and E Wulfsohn Rd

## Projected Bus traffic increase with expansion AM



## Projected Bus traffic increase with expansion PM





## Appendix G – PEDESTRIAN CROSSING ANALYSIS



**COLORADO**  
Department of Transportation

# COLORADO DEPARTMENT OF TRANSPORTATION



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## **Pedestrian Crossing Installation Guide**

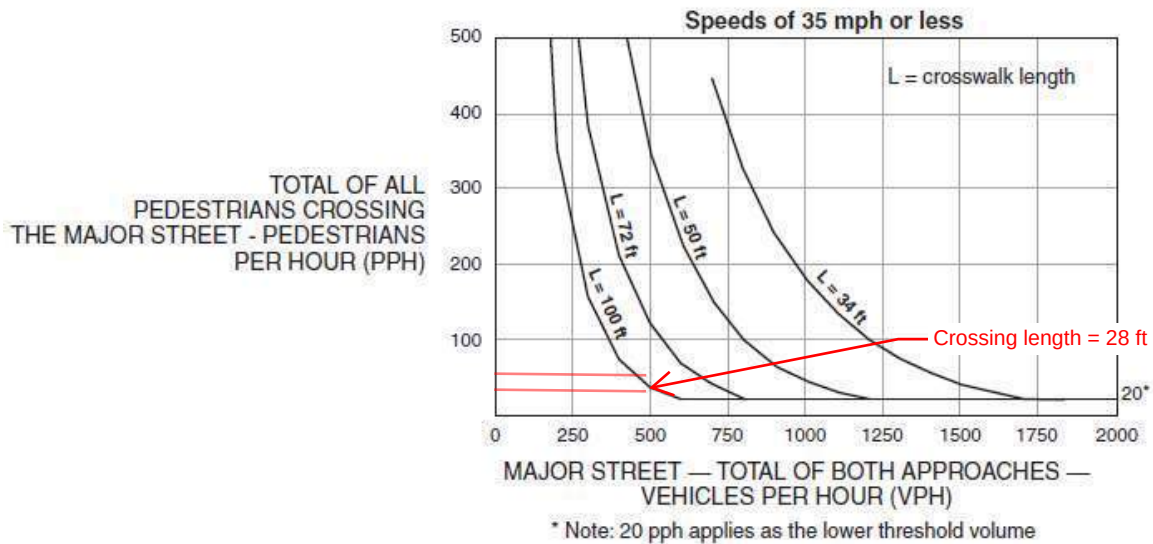
2021 Edition

## **Appendix B: Pedestrian Crossing Evaluation Worksheet**

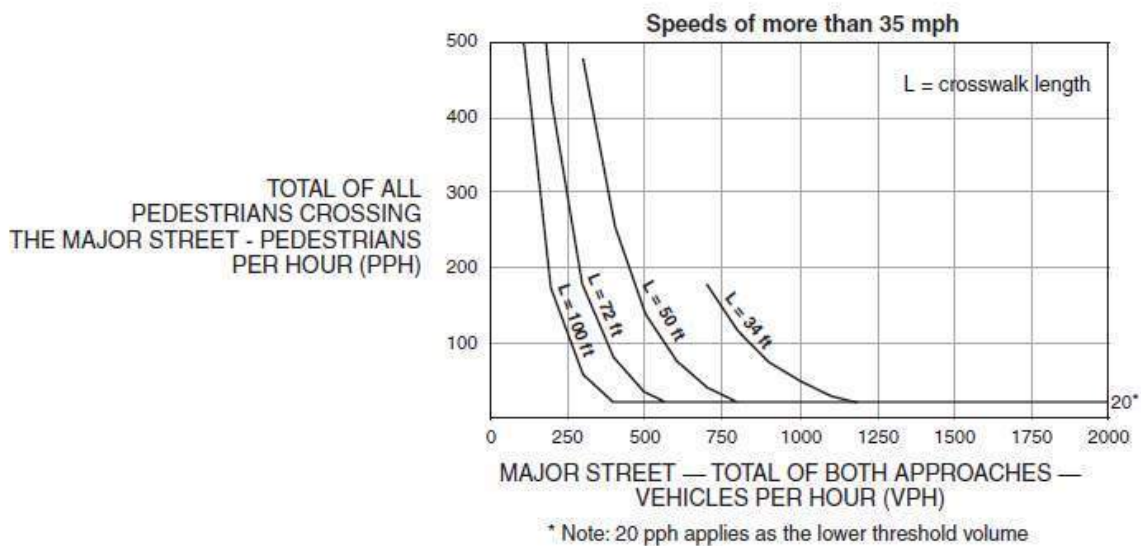
| Location Description                                                                                                                                                                                                                                                                                                                                                                          |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>State Highway &amp; Milepost:</b><br>Wulfsohn Road                                                                                                                                                                                                                                                                                                                                         |                                                          | <b>Major Street:</b><br>RFTA Access / PnR                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Crossing Location:</b><br><input checked="" type="checkbox"/> At Intersection <input type="checkbox"/> Mid-Block <input type="checkbox"/> Roundabout |
| <b>Existing Traffic Control:</b><br><input type="checkbox"/> Stop Sign <input type="checkbox"/> Traffic Signal <input checked="" type="checkbox"/> Uncontrolled                                                                                                                                                                                                                               |                                                          | <b>Existing Crossing Treatments (if any):</b><br>none                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Speed Limit:</b><br>25                                                                                                                               |
| <b>Official School Crossing:</b><br><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                                                                                                                                                                                                                                                                       |                                                          | <b>Nearby Pedestrian Generators</b> (schools, transit stops, commercial businesses, etc.):<br>RFTA Park and Ride and RFTA GMF |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| <b>Roadway Configuration:</b><br><input checked="" type="checkbox"/> 2-Lane <input type="checkbox"/> 3-Lane w/ Striped Median <input type="checkbox"/> 3-Lane w/ Raised Median<br><input type="checkbox"/> 4-Lane <input type="checkbox"/> 5-Lane w/ Striped Median <input type="checkbox"/> 5-Lane w/ Raised Median<br><input type="checkbox"/> 6-Lane <input type="checkbox"/> Other: _____ |                                                          |                                                                                                                               | <b>Crossing Distance by Direction:</b><br>Total Distance: 28<br>Dist. to Median: _____ <input checked="" type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W <input type="checkbox"/> Other _____<br>Dist. to Median: _____ <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W <input type="checkbox"/> Other _____ |                                                                                                                                                         |
| <b>Stopping Sight Distance</b> (uncontrolled locations only): 425                                                                                                                                                                                                                                                                                                                             |                                                          |                                                                                                                               | Is the SSD $\geq$ 8x the speed limit? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>If no, are improvements to SSD feasible? <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                |                                                                                                                                                         |
| Traffic Volumes and Operations                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                               | <b>AM</b>                                                | <b>MID-DAY</b>                                                                                                                | <b>PM</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>OTHER</b>                                                                                                                                            |
| Start and End Time:                                                                                                                                                                                                                                                                                                                                                                           | to                                                       | to                                                                                                                            | to                                                                                                                                                                                                                                                                                                                                                                                                                            | to                                                                                                                                                      |
| Day of Week:                                                                                                                                                                                                                                                                                                                                                                                  | Thursday                                                 |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| No. of Transit Boardings (if applicable):                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| No. of Young, Elderly, and Disabled Peds (YED):                                                                                                                                                                                                                                                                                                                                               |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| No. of Bicyclists:                                                                                                                                                                                                                                                                                                                                                                            |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| No. of Non YED Pedestrians:                                                                                                                                                                                                                                                                                                                                                                   |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| <b>Total Pedestrians</b> (adjusted for 2x YED):                                                                                                                                                                                                                                                                                                                                               | (13) 45                                                  |                                                                                                                               | (14) 48                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                         |
| Major Street Vehicle Volume (Daily): (2023 -184) / 2043 - 592 <b>DHV; ADT (1500 vpd) / 5000 vpd</b>                                                                                                                                                                                                                                                                                           |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| <b><u>Nearest Intersection (Direction #1)</u></b>                                                                                                                                                                                                                                                                                                                                             |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| Cross Street Name: Midland and RFTA Access(es)                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| Located at _____ feet to the <input type="checkbox"/> N <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W of the crossing location.                                                                                                                                                                                                                 |                                                          |                                                                                                                               | Signalized? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                               | <b>AM</b>                                                | <b>MID-DAY</b>                                                                                                                | <b>PM</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>OTHER</b>                                                                                                                                            |
| How many times per hour did the downstream vehicle queue back up into the pedestrian crossing?                                                                                                                                                                                                                                                                                                | 0                                                        |                                                                                                                               | 0                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                         |
| If multiple lanes per direction, are queue lengths approximately equal?                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                |
| If no, which lane is longer (inside, outside, middle) and by how much?                                                                                                                                                                                                                                                                                                                        |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| <b><u>Nearest Intersection (Direction #2)</u></b>                                                                                                                                                                                                                                                                                                                                             |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| Cross Street Name: _____                                                                                                                                                                                                                                                                                                                                                                      |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| Located _____ feet to the <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W of the crossing location.                                                                                                                                                                                                                               |                                                          |                                                                                                                               | Signalized? <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                               | <b>AM</b>                                                | <b>MID-DAY</b>                                                                                                                | <b>PM</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>OTHER</b>                                                                                                                                            |
| How many times per hour did the downstream vehicle queue back up into the pedestrian crossing?                                                                                                                                                                                                                                                                                                |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |
| If multiple lanes per direction, are queue lengths approximately equal?                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                |
| If no, which lane is longer (inside, outside, middle) and by how much?                                                                                                                                                                                                                                                                                                                        |                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                         |

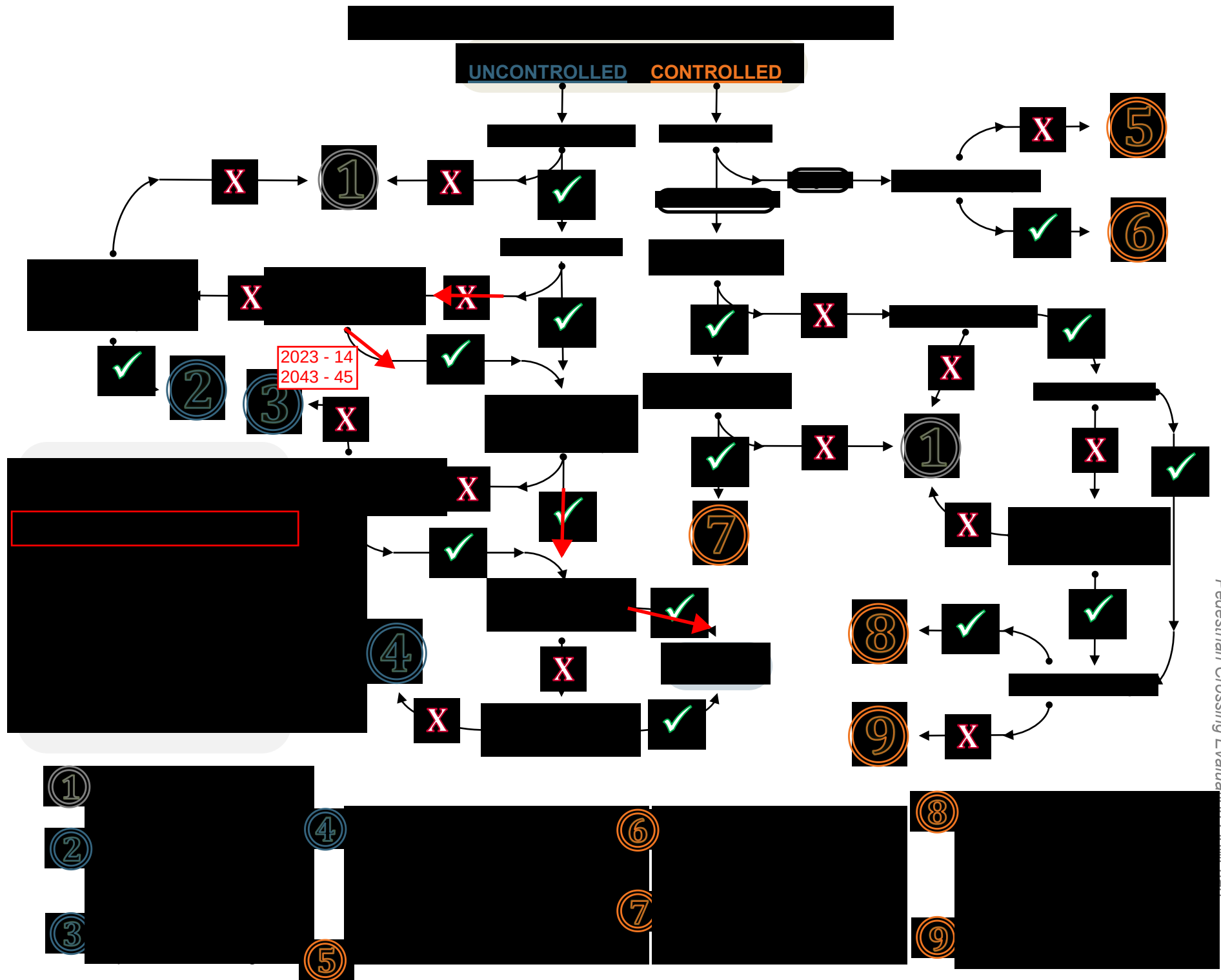
## Appendix C. Figures and Tables

**Figure C1. Guidelines for the Installation of Pedestrian Hybrid Beacons on Low-Speed Roadways**



**Figure C2. Guidelines for the Installation of Pedestrian Hybrid Beacons on High-Speed Roadways**





**Table C1. Criteria for Pedestrian Crossing Treatments at Uncontrolled Locations**

The criteria for pedestrian crossing treatments at uncontrolled locations is intended as a general minimum. Engineering judgment should be used on a case-by-case basis. Prevailing speed may be used if significantly different than posted speed.

| Roadway Configuration                         | Roadway ADT and Posted Speed (mph) |    |    |     |                    |    |    |     |                     |    |    |     |              |    |    |     |
|-----------------------------------------------|------------------------------------|----|----|-----|--------------------|----|----|-----|---------------------|----|----|-----|--------------|----|----|-----|
|                                               | 1,500 – 9,000 vpd                  |    |    |     | 9,001 – 12,000 vpd |    |    |     | 12,001 – 15,000 vpd |    |    |     | > 15,000 vpd |    |    |     |
|                                               | ≤30                                | 35 | 40 | ≥45 | ≤30                | 35 | 40 | ≥45 | ≤30                 | 35 | 40 | ≥45 | ≤30          | 35 | 40 | ≥45 |
| 2 lanes, one-way street                       | A                                  | B  | C  | E   | A                  | B  | C  | E   | B                   | B  | C  | E   | B            | C  | C  | E   |
| 2 lanes, two-way street with no median        | A                                  | B  | C  | E   | A                  | B  | C  | E   | B                   | B  | C  | E   | B            | C  | C  | E   |
| 3 lanes with raised median                    | A                                  | B  | D  | E   | A                  | C  | D  | E   | B                   | D  | D  | E   | C            | D  | D  | E   |
| 3 lanes without raised median                 | C                                  | C  | D  | E   | C                  | C  | D  | E   | C                   | C  | D  | E   | C            | D  | D  | E   |
| 4 lanes with raised median                    | A                                  | B  | C  | E   | A                  | B  | C  | E   | B                   | B  | C  | E   | B            | C  | C  | E   |
| 4 lanes, two-way street without raised median | A                                  | D  | D  | E   | B                  | D  | D  | E   | B                   | D  | D  | E   | D            | D  | D  | E   |
| 5 lanes with raised median                    | A                                  | B  | D  | E   | B                  | C  | D  | E   | B                   | C  | D  | E   | C            | C  | D  | E   |
| 5 lanes without raised median                 | D                                  | D  | D  | E   | D                  | D  | D  | E   | D                   | D  | D  | E   | D            | D  | D  | E   |
| 6 lanes with or without raised median         | F                                  | F  | F  | F   | F                  | F  | F  | F   | F                   | F  | F  | F   | F            | F  | F  | F   |

#### Treatment Descriptions:

- ☐ A. Install marked crosswalk with enhanced roadside signs.

*Install a marked crosswalk with a standard W11-2 with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a standard W11-2 advanced pedestrian warning sign. Use S1-1 signs for school crossing locations. An optional R6-1 may be used in addition.*

- ☐ B. Install marked crosswalk with enhanced roadside and in-roadway signs.

- ☐ C. Install marked crosswalk with enhanced signs and geometric improvements to increase pedestrian visibility and reduce exposure.

- ☐ D. Install marked crosswalk with enhanced signs, pedestrian activated RRFBs, and geometric improvements to increase visibility pedestrian and reduce exposure.

- ☐ E. Do not install marked crosswalk at uncontrolled crossing. Determine if speed limit can effectively be reduced to 40 mph by making geometric or other infrastructure changes (i.e., bulb out, median refuge, etc.). If so, utilize criteria D above. If this is not possible, if pedestrian volume meets warrants, consider a pedestrian hybrid beacon, pedestrian traffic signal, or grade separated crossing.

- ☐ F. Do not install marked crosswalk at uncontrolled crossings with three (3) or more through lanes per direction or where the speed limit is greater or equal to 45 mph and/or there is not a median refuge on a 5-lane crossing. Consider pedestrian hybrid beacon, pedestrian traffic signal, or separated crossing.



# ROARING FORK TRANSPORTATION AUTHORITY

## WEST GLENWOOD TRANSIT CENTER (PHASE 6A)

2307 WULFSOHN RD.  
GLENWOOD SPRINGS, COLORDO 81601

50% CONSTRUCTION DOCUMENTS

PROJECT OWNER  
2307 WULFSOHN RD.  
GLENWOOD SPRINGS, COLORDO 81601  
970.925.8484

ROARING FORK TRANSPORTATION AUTHORITY  
**WEST GLENWOOD TRANSIT CENTER  
(PHASE 6A)**  
2307 WULFSOHN RD.  
GLENWOOD SPRINGS,  
COLORDO 81601

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Checked By A. JAUCH  
Drawn By SEH

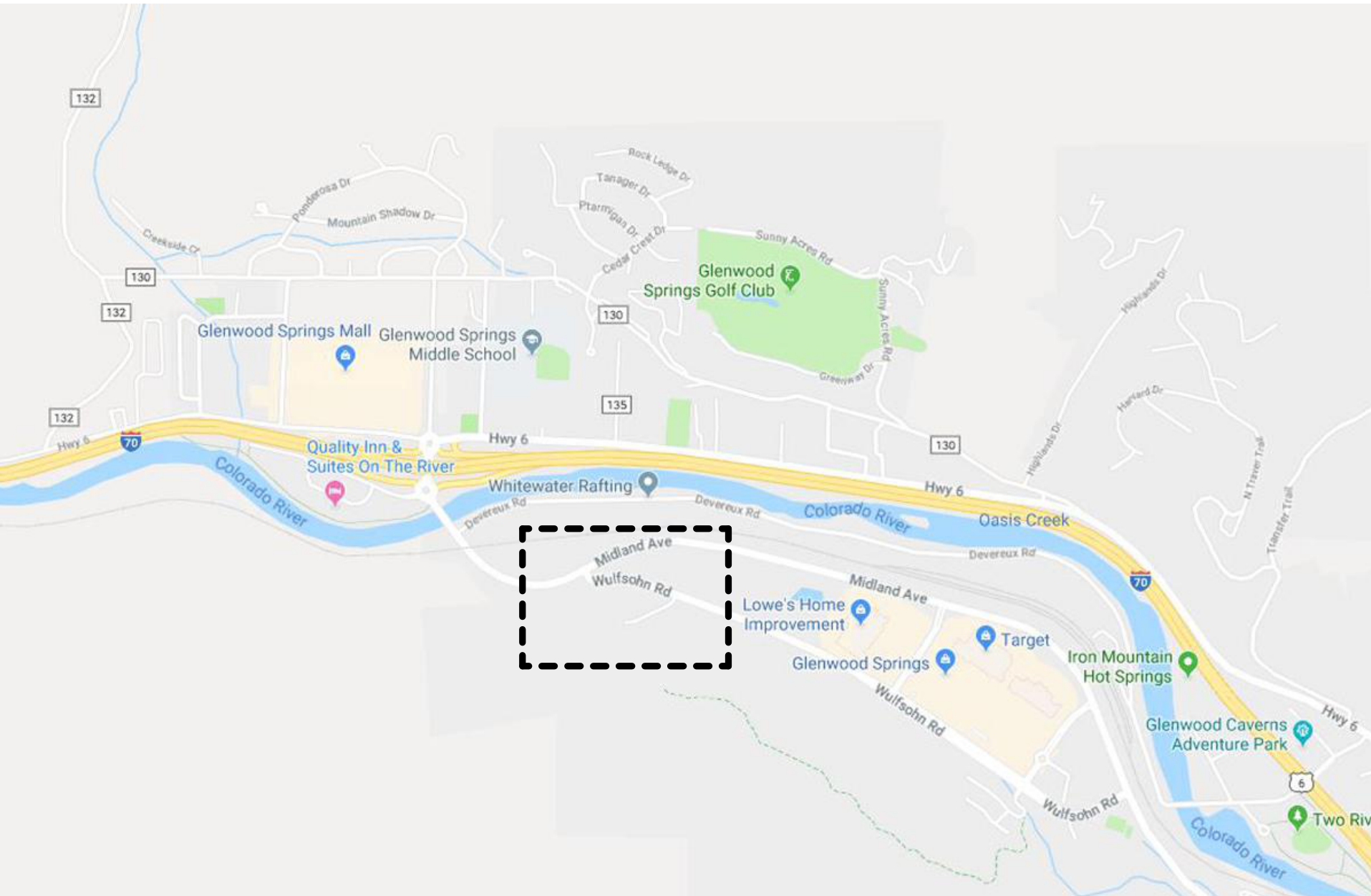
Project Status Issue Date  
50% CONSTRUCTION 09/17/24  
DOCUMENTS

| REVISION SCHEDULE |             |      |
|-------------------|-------------|------|
| REV. #            | DESCRIPTION | DATE |

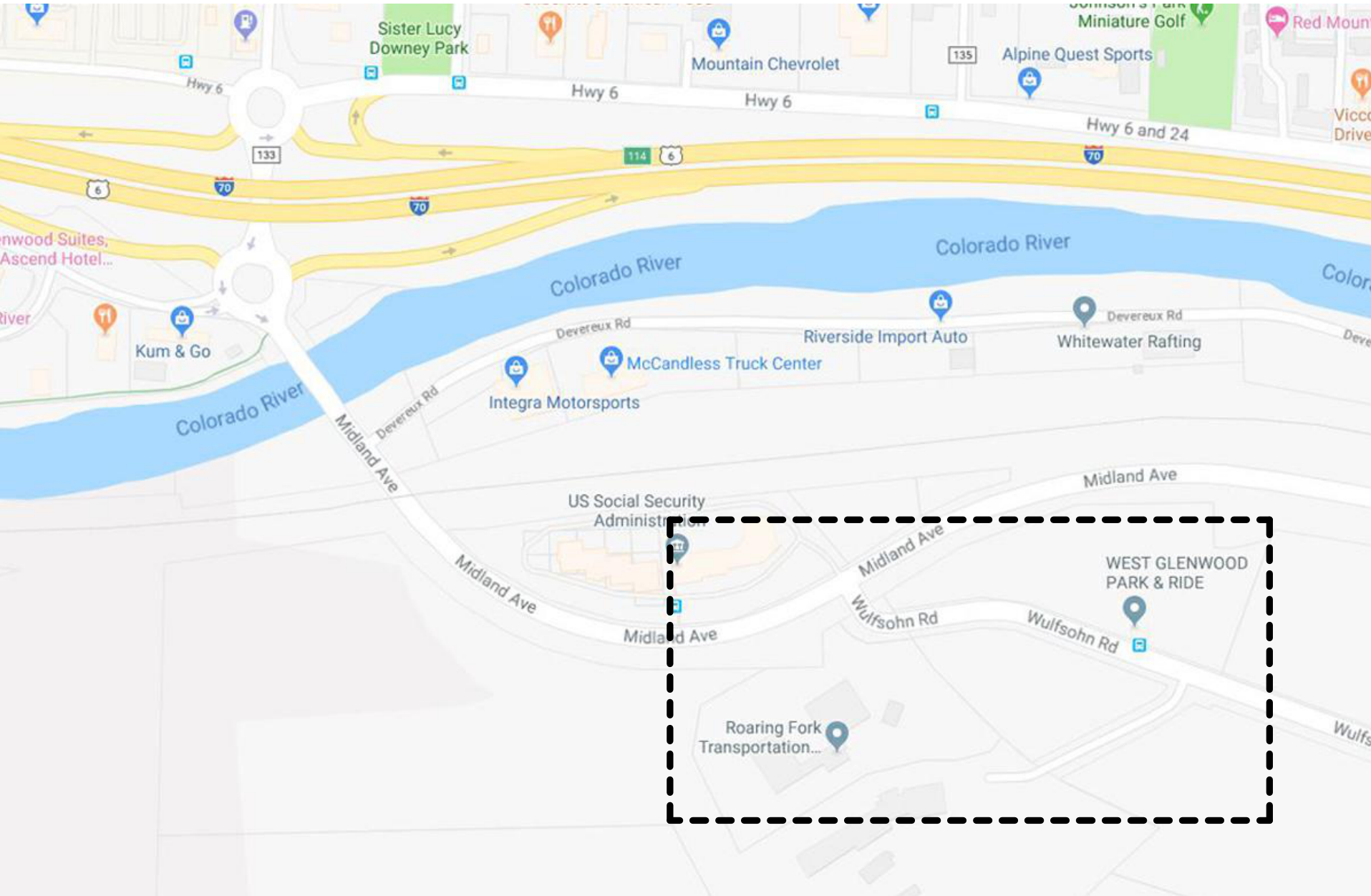
COVER SHEET (PH-6A)

G001

VICINITY MAP



LOCATION MAP



### PROJECT DIRECTORY

#### PROJECT OWNER

ROARING FORK TRANSPORTATION  
AUTHORITY  
2307 WULFSOHN RD.  
GLENWOOD SPRINGS, COLORDO 81601

#### ARCHITECT / CIVIL / STRUCTURAL

SHORT ELLIOTT HENDRICKSON, INC.  
2000 SOUTH COLORADO BOULEVARD  
TOWER ONE, SUITE 6000  
DENVER, COLORADO 80222

#### LANDSCAPE

DHM DESIGN CORPORATION  
225 MAIN STREET SUITE 201  
CARBONDALE, COLORADO 81623

#### MECHANICAL / PLUMBING

SHORT ELLIOTT HENDRICKSON, INC.  
2000 SOUTH COLORADO BOULEVARD  
TOWER ONE, SUITE 6000  
DENVER, COLORADO 80222

#### ELECTRICAL

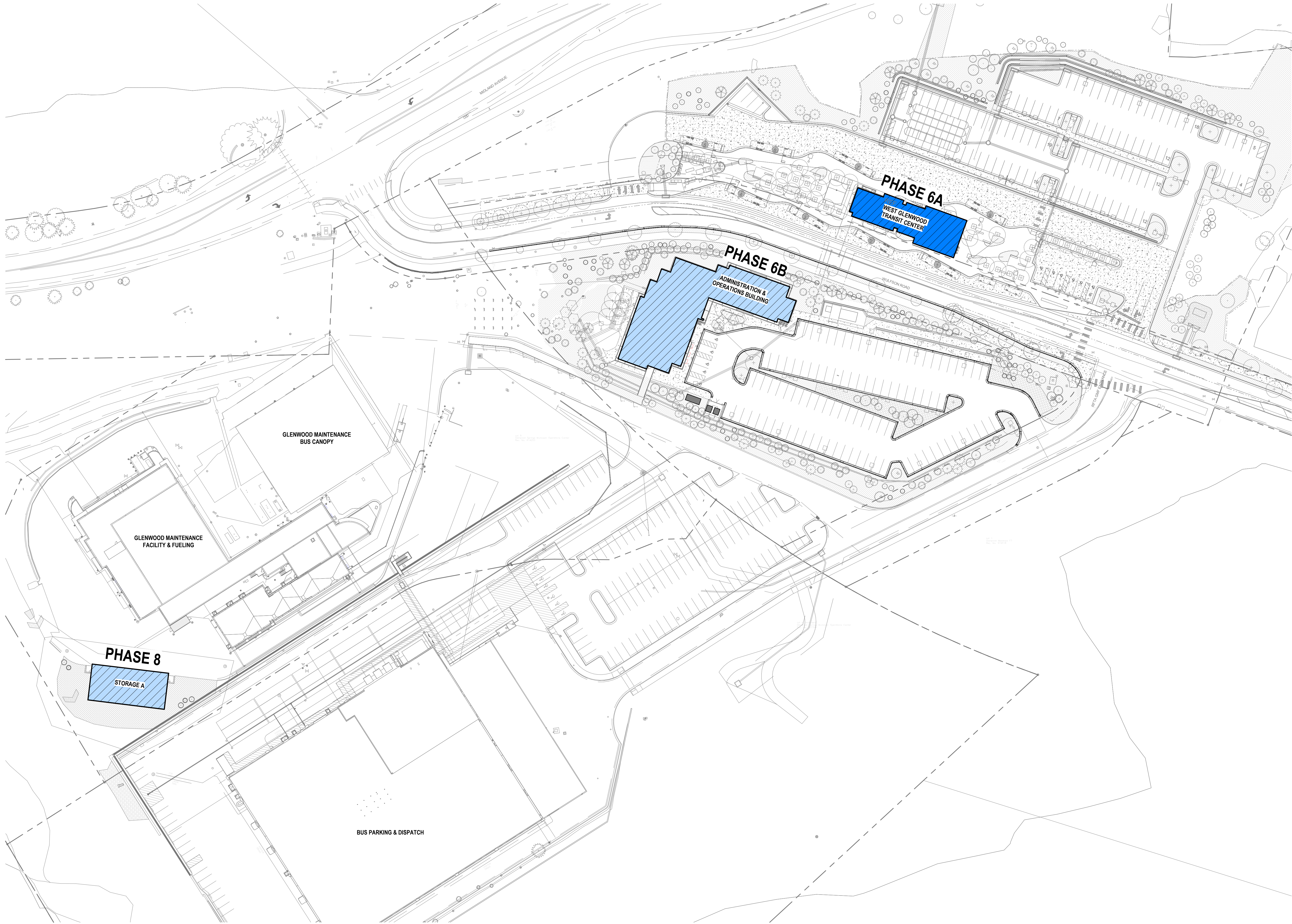
CMO CONSULTING ENGINEERS, LLC  
11646 SUN BEAR TRL  
GOLDEN, COLORADO 80403

#### TECHNOLOGY / ACOUSTICS

K2 - SALAS O'BRIEN COMPANY  
4900 NAUTILUS CT N SUITE 200  
BOULDER, CO 80301



THIS BAR IS INTENDED TO BE 1" PRINTED AT FULL SCALE



1  
G003

OVERALL PROJECT PHASING PLAN (PH 6A)

1" = 50'-0"



NOT FOR  
CONSTRUCTION

PROJECT OWNER  
2307 WULFSOHN RD.  
GLENWOOD SPRINGS, COLORADO 81601  
970.925.8484

ROARING FORK TRANSPORTATION AUTHORITY  
**W.G. TRANSIT CENTER  
(PHASE 6A)**

2307 WULFSOHN RD.  
GLENWOOD SPRINGS,  
COLORADO 81601

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SEH Project 173800  
Checked By A. JAUCH  
Drawn By C. RODRIGUEZ

Project Status Issue Date  
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DOCUMENTS

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|-------------------|-------------|------|
| REV. #            | DESCRIPTION | DATE |

OVERALL PROJECT  
PHASING PLAN (PH-6A)

G003



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SURVEYING

1. PRIOR TO BEGINNING WORK ON THE PROJECT, THE CONTRACTOR'S SURVEYOR SHALL PERFORM A SURVEY TO VERIFY ALL SURVEY CONTROL POINTS, SECTION CORNERS, AND BENCHMARKS AS SHOWN ON THE HORIZONTAL CONTROL PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL LAND SURVEY MONUMENTS DISRUPTED BY CONSTRUCTION ACTIVITIES OR BY NEGLIGENCE ON THE PART OF THE CONTRACTOR. THE CONTRACTOR IS REQUIRED TO FOLLOW COLORADO STATE LAW REGARDING SURVEY MONUMENTS. THE CONTRACTOR SHALL RETAIN A COLORADO LICENSED PROFESSIONAL LAND SURVEYOR TO RESET ANY AFFECTED SURVEY MONUMENTS. THIS WILL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
2. PROPOSED FINISHED GROUND ELEVATIONS FOR ITEMS TO BE ADJUSTED, RESET OR MODIFIED SHALL BE FIELD VERIFIED BY THE CONTRACTOR. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IF DISCREPANCIES ARE NOTED.

GENERAL

1. THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN AND OBTAIN CITY APPROVAL PRIOR TO ANY WORK WITHIN PUBLIC RIGHT-OF-WAY. THE CLOSURE AND DETOUR DURATION SHOULD BE LIMITED AS MUCH AS POSSIBLE.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASPECTS OF SAFETY INCLUDING, BUT NOT LIMITED TO EXCAVATION, TRENCHING, SHORING, TRAFFIC CONTROL, AND SECURITY.
3. THE CONTRACTOR SHOULD REMOVE MATERIALS AND EQUIPMENT FROM THE ROADWAY ROW AT THE CLOSE OF DAILY OPERATIONS. THE CONTRACTOR SHALL NOT STOCKPILE MATERIAL IN THE CLEAR ZONE OF THE TRAVELED WAY.
4. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PROJECT PERMITS ASSOCIATED WITH CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR BEING AWARE OF, NOTIFYING, COORDINATING AND SCHEDULING ALL INSPECTIONS REQUIRED FOR FINAL APPROVALS AND PROJECT ACCEPTANCE. ALL WORK, INCLUDING CORRECTION WORK, IS SUBJECT TO NOTIFICATION AND INSPECTION REQUIREMENTS.
5. IF ANY OF THE CONTRACTOR'S OPERATIONS DESTROY OR DAMAGE ANY PROPERTY, PUBLIC OR PRIVATE, THE CONTRACTOR SHALL PROMPTLY REPAIR OR REPLACE SUCH PROPERTY, TO THE SATISFACTION OF THE PROJECT MANAGER, BEFORE THE CITY WILL ACCEPT OR PAY FOR THE WORK PERFORMED UNDER THE CONTRACT. IF THE CONTRACTOR FAILS TO REPAIR OR REPLACE SUCH PROPERTY, THE CITY, AT THE SOLE DISCRETION OF THE MANAGER, MAY UNDERTAKE SUCH REPAIR OR REPLACEMENT AND DEDUCT THE COST OF THE SAME FROM AMOUNTS PAYABLE TO THE CONTRACTOR UNDER THE CONTRACT.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING AS-BUILT INFORMATION ON A SET OF RECORD DRAWINGS KEPT ON THE CONSTRUCTION SITE, AND AVAILABLE TO THE CITY INSPECTOR AT ALL TIMES. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL SUBMIT RECORD DRAWINGS, IN AN AUTOCAD COMPATIBLE FORMAT, TO THE CITY. THE PRODUCTION OF THESE DOCUMENTS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
7. PRIOR TO FINAL ACCEPTANCE, ALL DISTURBED PORTIONS OF ROADWAY ROW SHALL BE CLEANED UP AND RESTORED TO THEIR ORIGINAL CONDITION, SUBJECT TO CITY APPROVAL.
8. NO WORK SHALL BE PERMITTED ON WEEKENDS OR HOLIDAYS WITHOUT PRIOR AUTHORIZATION OR UNLESS OTHERWISE SPECIFIED. THE CITY MAY RESTRICT WORK IN THE ROW DURING ADVERSE WEATHER CONDITIONS OR DURING PERIODS OF HIGH TRAFFIC VOLUME.
9. NO CLEATED OR TRACKED EQUIPMENT MAY WORK IN OR MOVE OVER PAVED SURFACES WITHOUT MATS.
10. IF UNKNOWN/UNIDENTIFIED UNDERGROUND STORAGE TANKS, DRUMS, ODOROUS SOIL, STAINED SOIL, ASBESTOS-CEMENT PIPE, TRANSITE, BUILDING DEBRIS OR WASTE MATERIALS ARE ENCOUNTERED DURING THE PROJECT, CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA AND INFORM THE OWNER.
11. CONTRACTOR SHALL TAKE REASONABLE MEASURES TO PREVENT PARTICULATE MATTER FROM BECOMING AIRBORNE AND TO PREVENT THE VISIBLE DISCHARGE OF FUGITIVE PARTICULATE EMISSIONS BEYOND THE PROPERTY ON WHICH THE EMISSIONS ORIGINATE. THE MEASURES TAKEN MUST BE EFFECTIVE IN THE CONTROL OF FUGITIVE PARTICULATE EMISSIONS AT ALL TIMES ON THE SITE, INCLUDING PERIODS OF INACTIVITY SUCH AS EVENINGS, WEEKENDS, AND HOLIDAYS AS WELL AS ANY OTHER PERIOD OF INACTIVITY.
12. THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL WASTE FROM PROJECT IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS.
13. A STATE CONSTRUCTION STORMWATER DISCHARGE PERMIT IS REQUIRED AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE PERMIT. 'FOR REFERENCE' EROSION CONTROL PLAN DRAWINGS ARE PROVIDED FOR INFORMATION PURPOSES ONLY.

PROJECT PLANS, SPECIFICATIONS, PERMITS

1. ALL MATERIAL, EQUIPMENT, INSTALLATION AND CONSTRUCTION WITHIN THE ROW SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE FOLLOWING STANDARD REFERENCES AS APPLICABLE:
  - 1.1. CITY OF GLENWOOD SPRINGS ENGINEERING STANDARDS
  - 1.2. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND STANDARD PLANS, (M&S STANDARDS)
  - 1.3. FEDERAL HIGHWAY ADMINISTRATION (FHWA), MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS AND THE COLORADO SUPPLEMENT THERETO
  - 1.4. AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS (AASHTO) ROADSIDE DESIGN GUIDE
2. THE OWNER RESERVES THE RIGHT TO ACCEPT OR REJECT ANY MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE LATEST EDITION OF THE APPLICABLE STANDARDS SPECIFICATIONS, OR HALT CONSTRUCTION UNTIL THE CONFLICT IS RESOLVED.
3. THE CONTRACTOR SHALL HAVE ONSITE AT ALL TIMES, ONE COPY OF THE APPROVED PLANS, ONE COPY OF THE APPROPRIATE STANDARDS AND SPECIFICATIONS, AND COPIES OF ANY PERMITS AND EXTENSION AGREEMENTS NEEDED FOR THE JOB.
4. IF DURING THE CONSTRUCTION PROCESS, CONDITIONS ARE ENCOUNTERED WHICH COULD INDICATE A SITUATION THAT IS NOT IDENTIFIED ON THE PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL CONTACT THE OWNER IMMEDIATELY.

UTILITIES

1. THE TYPE, SIZE, LOCATION AND NUMBER OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THE DRAWINGS, UNLESS OTHERWISE NOTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF THE WORK BEFORE COMMENCING NEW CONSTRUCTION. THE CONTRACTOR SHALL COOPERATE WITH COMPANIES TRYING TO COORDINATE THE RELOCATION EFFORT. LINES NOT RELOCATED SHALL BE PROTECTED BY THE CONTRACTOR IN PLACE. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AT 811, AT LEAST 2 WORKING DAYS PRIOR TO BEGINNING EXCAVATION OR GRADING.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING UTILITIES DURING CONSTRUCTION AND SHALL HOLD THE CITY AND ITS ENGINEERS HARMLESS FOR DAMAGES ARISING FROM THE CONTRACTOR'S FAILURE TO ADEQUATELY PROTECT EXISTING UTILITIES. DAMAGED UTILITIES SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR.
3. THE CONTRACTOR IS REQUIRED TO RESET, ADJUST OR REPLACE ANY UTILITIES THAT ARE IMPACTED BY CONSTRUCTION AND ARE INTENDED TO REMAIN WITHIN THE PROJECT LIMITS.
4. FIRE HYDRANT ASSEMBLY INCLUDES INSTALLATION OF ALL MATERIALS SHOWN ON WATER STANDARD DETAIL W03 (FIRE HYDRANT ASSEMBLY DETAIL)
5. CITY INSPECTIONS ARE REQUIRED FOR THE ENTIRE LENGTH OF BOTH WATER AND SEWER SERVICE LINES. PROVIDE CITY 2 BUSINESS DAYS' NOTICE.
6. PER SB18-167, ALL NEW UNDERGROUND FACILITIES INSTALLED ON OR AFTER JANUARY 1, 2020, MUST BE ELECTRONICALLY LOCATABLE WHEN INSTALLED.

WATER

1. WATER SERVICE LINES ARE TO BE K COPPER OR PLASTIC POLY ETHYLENE (PE) ONLY, NO COPPER PIPE LARGER THAN 1" IN DIAMETER IS PERMITTED. USE PE OR DUCTILE IRON PIPE (DIP) ABOVE 1" DIAMETER. ONLY NSF61 MATERIALS ARE TO BE USED. GALVANIZED AND BLACK IRON PIPING AND FITTINGS ARE NOT ALLOWED ON THE DOMESTIC LINE AND ARE ONLY PERMITTED AFTER THE BF ON FIRE LINES.
2. SERVICE LINES ARE TO BE ALL NEW MATERIAL WITHOUT ANY UV FADING, KINKS, OR ANY DAMAGE.
3. NO SERVICES SHALL HAVE IN-LINE COUPLINGS UNLESS APPROVED IN ADVANCE BY INSPECTOR.
4. ONLY COMPRESSION TYPE CORPORATION AND CURB-STOP VALVES AND FITTINGS ARE PERMITTED UNDERGROUND, NO SOLDER OR GLUE JOINTS ARE PERMITTED ON UNDERGROUND WATER PIPES.
5. SERVICE VALVE MUST HAVE A McDONALD TYPE CURB BOX WITH STEM. THE CAP MUST BE PROTECTED AND BE AT OR ABOVE FINISHED GRADE, PROVIDE FLAT 12" STONE OR CONCRETE PAD UNDER VALVE, LOCATED WITHIN 1' PROPERTY LINE.
6. ANY EXTENSION COUPLINGS TO CURB BOX MUST BE WELDED. CAP IS TO BE "HAND TIGHT".
7. 6" MINIMUM BEDDING UNDER PIPE, 12" OVER TOP - ¾" MINUS SCREENED AGGREGATE, BACK FILL WITH 6" MINUS STRUCTURAL FILL OR 6" MINUS PIT RUN.
8. THE MINIMUM EARTH COVER OVER WATER TRANSMISSION AND DISTRIBUTION LINES SHALL BE 5.5 FEET. A GREATER DEPTH SHALL BE PROVIDED TO AVOID EXCESSIVE HIGH POINTS IN THE MAIN OR WHERE IT IS NECESSARY TO CLEAR EXISTING STRUCTURES OR OBSTRUCTIONS. WATER SERVICE LINES SHALL HAVE THE SAME MINIMUM COVER.
9. CONNECTIONS TO CITY WATER MAINS MUST BE PERFORMED WITH CITY INSPECTOR ON SITE.
10. CONTRACTOR MUST PROVIDE AS-BUILT DRAWING OF ALL NEW PRIVATE LINES.

SANITARY SEWER

1. SDR-35 PUSH-ON GASKET JOINT, PVC PIPE ONLY – 90 DEGREE GASKET SDR-35 WYE FOR CLEANOUT REQUIRED.
2. NO GLUE TOGETHER PIPE JOINTS UNDERGROUND OUTSIDE FOUNDATION.
3. 6" MINIMUM BEDDING UNDER PIPE, 12" OVER TOP - ¾" MINUS SCREENED AGGREGATE, BACK FILL WITH 6" MINUS STRUCTURAL FILL OR 6" MINUS PIT RUN.
4. BELL ENDS MUST FACE UP-HILL, ALL JOINTS FULLY INSERTED.
5. USE FOOD GRADE LUBRICANT "DUCK BUTTER" AT ALL SLIP JOINTS.
6. SEWER LINES MUST BE AT LEAST 10' FROM WATER LINES.
7. IF CROSSING WATER LINES, CENTER A 20" STICK OF C-905 OR SDR-35 OF SEWER SERVICE PIPE AT THE CROSSING.
8. SLOPE MUST BE GREATER THAN 2%.
9. NO 90 DEGREE FITTINGS.
10. CLEAN OUT WITH "Y" EVERY 150' OF PIPE RUN OR EVERY 180 DEGREES OF BENDS.
11. CLEAN OUT WITH DOUBLE "Y" WITHIN 5' OF OUTSIDE BUILDING FOUNDATION WALL, A SINGLE "Y" CLEANOUT IS ALLOWED IF A CO IS ACCESSIBLE INSIDE BUILDING.
12. ACCESS TO CLEAN OUT WILL BE AT 4" (+/-1") ABOVE FINISH GRADE, WATERTIGHT CAPPED AND MARKED WITH REBAR OR IRON POST. ACCESS WITHIN PAVED AREAS WILL REQ. STREET BOX.
13. CONTRACTOR WILL PROVIDE AS-BUILT DRAWING OF ALL NEW PRIVATE SERVICE LINES.

REMOVALS, EXISTING ITEMS, SAW CUTTING

1. ALL ITEMS TO BE REMOVED AND NOT RESET SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
2. WHERE IT IS REQUIRED TO REMOVE EXISTING CONCRETE OR ASPHALT, CUTTING SHALL BE DONE TO A NEAT WORK LINE TO FULL DEPTH USING A SAW, CUTTING WHEEL, OR OTHER METHOD APPROVED BY THE PROJECT MANAGER. THIS WILL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
3. REMOVAL OF EXISTING CURB AND GUTTER, SIDEWALK, DRIVEWAYS, CURB CUTS, AND OTHER CONCRETE ITEMS THAT ARE ATTACHED OR ADJACENT TO OTHER CONCRETE ITEMS SHALL BE REMOVED TO THE NEAREST JOINT, AS NEEDED TO AVOID DAMAGING THE REMAINING CONCRETE ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ADJACENT SIDEWALK DURING CURB AND GUTTER REMOVAL AND SHALL REPLACE DAMAGED SECTIONS AT NO ADDITIONAL COST TO THE PROJECT.
4. THE CONTRACTOR IS REQUIRED TO RESET, ADJUST, OR REPLACE ANY UTILITIES, LANDSCAPING, SPRINKLER SYSTEMS, SIGNS, SIDEWALKS, ETC. THAT ARE IMPACTED BY CONSTRUCTION AND ARE NOT DESIGNATED TO BE REMOVED.

PAVEMENT

1. A TACK COAT IS REQUIRED PRIOR TO THE PLACEMENT OF SUBSEQUENT LIFTS OF HMA.
2. WHERE NEW CONSTRUCTION IS TO ABUT EXISTING PAVEMENT, THE EXISTING PAVEMENT SHALL BE REMOVED TO A NEAT VERTICAL LINE TO CREATE A CLEAN CONSTRUCTION JOINT.
3. WHEN AN EXISTING ASPHALT STREET IS CUT, THE STREET MUST BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. THE EXISTING STREET CONDITION SHALL BE DOCUMENTED BEFORE ANY CUTS ARE MADE. PATCHING SHALL BE DONE IN CONFORMANCE WITH THE PROJECT STANDARDS. THE FINISHED PATCH SHALL BLEND SMOOTHLY INTO THE EXISTING SURFACE. ALL LARGE PATCHES SHALL BE PAVED WITH AN ASPHALT LAY-DOWN MACHINE.

EARTHWORK AND EXCAVATIONS

1. THE CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THOSE AREAS WITHIN THE LIMITS OF DISTURBANCE AND TOES OF SLOPE AS SHOWN ON THE PLANS. ANY DISTURBANCE BEYOND THESE LIMITS SHALL BE RESTORED TO ORIGINAL CONDITIONS AT THE EXPENSE OF THE CONTRACTOR.
2. WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. COST FOR DUST PALLIATIVE SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE WORK.
3. MOISTURE DENSITY CONTROL SHALL BE APPLIED FULL DEPTH FOR ALL FILL.
4. DURING EACH PHASE OF CONSTRUCTION, THE CONTRACTOR SHALL SHAPE TO DRAIN AND COMPACT THE WORK AREA TO A UNIFORM CROSS-SECTION. ELIMINATE ALL RUTS AND LOW SPOTS THAT COULD HOLD WATER. AREAS AND FACILITIES SUBJECTED TO FLOODING, REGARDLESS OF THE SOURCE OF WATER, SHALL BE PROMPTLY DEWATERED AND RESTORED AT NO ADDITIONAL COST TO THE CITY.
5. WHERE CONSISTENT WITH SAFETY AND SPACE CONSIDERATIONS, EXCAVATED MATERIAL IS TO BE PLACED ON THE UPHILL SIDE OF TRENCHES.
6. CONTRACTOR TO REVIEW AND COMPLY WITH RECOMMENDATIONS OF THE "FINAL REPORT, GEOTECHNICAL INVESTIGATION, RFTA WEST GLENWOOD SPRINGS PARK N RIDE, PAVEMENT AND RETAINING WALL RECOMMENDATIONS, GLENWOOD SPRINGS, COLORADO" JULY 30, 2015 PREPARED BY YEH AND ASSOCIATES.

7. EXISTING ONSITE SOIL MATERIALS MAY BE REUSED AS FILL UNDER PAVING AFTER SCREENING AND RECOMPACTION OF MATERIAL TO RECOMMENDATIONS IN PROJECT GEOTECHNICAL STUDY. MATERIALS BENEATH FOUNDATIONS SHALL BE STRUCTURAL FILL.

CONCRETE

1. IF CONCRETE REPLACEMENT IS NECESSARY, THE ENTIRE AFFECTED SLAB OR PANEL MUST REPLACED.
2. SIDEWALK SHALL BE CLASS P CONCRETE. THE USE OF ¾ INCH (#67) TOP SIZE AGGREGATE IS ALLOWED.
3. BENDER BOARDS (TWO INCH MINIMUM THICKNESS) SHALL BE USED ON ALL CURVES OF LESS THAN 75 FOOT RADIUS.
4. THE CONTRACTOR SHALL INSTALL ½ IN EXPANSION JOINT MATERIAL BETWEEN THE CURB, CURB AND GUTTER AND THE SIDEWALK, AND AROUND INLET STRUCTURES OR BLOCKOUTS OR AS DIRECTED BY THE PROJECT MANAGER.
5. CURB RAMPS SHALL BE CONSTRUCTED USING TRUNCATED DOMES AS SHOWN IN THE CITY STANDARD DETAILS. TRUNCATED DOMES AND GROOVES SHALL NOT BE PAID SEPARATELY, BUT INCLUDED IN THE COST OF THE CONCRETE CURB RAMP.

TRAFFIC

1. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE TRAFFIC CONTROL THROUGHOUT THE PROJECT, INCLUDING PROPER TRAFFIC CONTROL DEVICES AND PERSONNEL.
2. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY PERMITS REQUIRED FOR WORK IN CDOT RIGHT-OF-WAY.

DRAINAGE

1. ALL SEWER PIPES SHALL BE INSTALLED WITH CLASS B BEDDING AS A MINIMUM.
2. SANITARY SEWER PIPES SHALL BE SDR 26 PVC AND CONFORM TO ASTM D3034.
3. THE CONTRACTOR PERFORMING WORK ON ANY PUBLIC OR PRIVATE STORM SEWER FACILITY OR APPURTENANCE MUST BE PROPERLY TRADE LICENSED AS A COMPANY AND HAVE A LICENSED PLUMBER OR CERTIFIED JOURNEYMAN DRAINLAYER ON SITE DURING THE WORK.
4. ACCESS MUST BE MAINTAINED FOR ALL SEWER MANHOLES DURING CONSTRUCTION. MINIMUM ACCESS TO EACH MANHOLE IS A 20 FOOT WIDE LANE FROM THE NEAREST PUBLIC RIGHT OF WAY, CENTERED AT THE MANHOLE INCLUDING A 10 FOOT RADIUS AROUND THE MANHOLE AND 22.0 FEET OF VERTICAL CLEARANCE.

EROSION CONTROL

1. THE CONTRACTOR MUST IMPLEMENT AND COMPLY WITH THE APPROVED EROSION CONTROL PLAN AND ASSOCIATED DOCUMENTS FOR THIS PROJECT.
2. THE CONTRACTOR SHALL PREVENT SEDIMENT, DEBRIS AND ALL OTHER POLLUTANTS FROM ENTERING THE STORM SEWER SYSTEM DURING ALL DEMOLITION, EXCAVATION, TRENCHING, BORING, GRADING, OR OTHER CONSTRUCTION OPERATIONS THAT ARE PART OF THIS PROJECT. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR REMEDIATION OF ANY ADVERSE IMPACTS TO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM, RECEIVING WATERS, WATERWAYS, WETLANDS, AND OR OTHER PUBLIC OR PRIVATE PROPERTIES, RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
3. THE CONTRACTOR SHALL REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO OR ACCUMULATE IN, THE FLOWLINES, STORM DRAINAGE APPURTENANCES, AND PUBLIC RIGHTS OF WAYS OF THE CITY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SAID REMOVAL SHALL BE CONDUCTED IN A TIMELY MANNER.
4. SOIL STABILIZATION MEASURES SHALL BE IMPLEMENTED WITHIN FOURTEEN (14) DAYS FOLLOWING COMPLETION OF GRADING ACTIVITIES. STABILIZATION OF DISTURBED AREAS ADJACENT TO RECEIVING WATERS OR WITH SLOPES 3 TO 1 OR GREATER SHALL BE COMPLETED WITHIN SEVEN (7) DAYS FOLLOWING COMPLETION OF GRADING ACTIVITIES. NOTE: FEDERAL AND STATE REGULATIONS MAY SOON REQUIRE STABILIZATION WITHIN SEVEN (7) DAYS OF COMPLETION OF GRADING ACTIVITIES.
5. THE DEVELOPER, GENERAL CONTRACTOR, GRADING CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL INSURE THAT ALL LOADS OF CUT AND FILL MATERIAL IMPORTED TO OR EXPORTED FROM THIS SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORT ON PUBLIC RIGHTS OF WAY.
6. THE USE OF REBAR TO ANCHOR BEST MANAGEMENT PRACTICES IS PROHIBITED.
7. SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE PROTECTED FROM WIND AND WATER EROSION WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. STABILIZATION OF STOCKPILES LOCATED WITHIN 100 FEET OF RECEIVING WATERS, OR WITH SLOPES 3 TO 1 OR GREATER SHALL BE COMPLETED WITHIN SEVEN (7) DAYS FOLLOWING STOCKPILE CONSTRUCTION. STABILIZATION AND PROTECTION OF THE STOCKPILE MAY BE ACCOMPLISHED BY ANY OF THE FOLLOWING: MULCHING, TEMPORARY/PERMANENT REVEGETATION OPERATIONS, OR EROSION CONTROL MATTING/GEOTEXTILES. IF STOCKPILES ARE LOCATED WITHIN 100 FEET OF RECEIVING WATERS, A DRAINAGEWAY OR THE SITE PERIMETER, ADDITIONAL SEDIMENT CONTROLS SUCH SHALL BE REQUIRED.

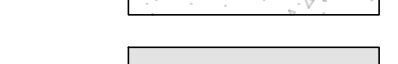
EROSION CONTROL

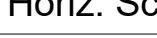
8. APPROVED EROSION AND SEDIMENT CONTROL 'BEST MANAGEMENT PRACTICES' SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. AT A MINIMUM, THE PERMITTEE OR CONTRACTOR SHALL PRODUCE AND RETAIN WEEKLY WRITTEN INSPECTION RECORDS FOR ALL BMPS AND AFTER SIGNIFICANT PRECIPITATION EVENTS. ALL NECESSARY MAINTENANCE AND REPAIR SHALL BE COMPLETED IMMEDIATELY. ADDITIONALLY, STREET SWEEPING IS TO BE COMPLETED BY THE CLOSE OF THE BUSINESS DAY OR (AND) ON AN AS NEEDED BASIS THROUGHOUT THE DAY.
9. WATER USED IN THE CLEANING OF CEMENT TRUCK DELIVERY CHUTES SHALL BE DISCHARGED INTO A PREDEFINED, CONCRETE WASHOUT AREA ON THE JOB SITE. BERMED CONTAINMENT OR COMMERCIALY AVAILABLE CONCRETE WASHOUT DEVICES THAT FULLY CONTAIN ALL WASH WATER ARE ACCEPTABLE. WASH WATER DISCHARGED INTO THE CONTAINMENT AREA OR DEVICE SHALL BE ALLOWED TO INFILTRATE, EVAPORATE, AND OR BE DISPOSED OF IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS. DRIED CEMENT WASTE IS TO BE REMOVED FROM THE CONTAINMENT AREA AND PROPERLY DISPOSED.
10. THE CONTRACTOR SHALL PROTECT ALL STORM SEWER FACILITIES ADJACENT TO ANY LOCATION WHERE PAVEMENT CUTTING OPERATIONS INVOLVING WHEEL CUTTING, SAW CUTTING, OR ABRASIVE WATER JET CUTTING ARE TO TAKE PLACE. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL WASTE PRODUCTS GENERATED BY SAID CUTTING OPERATIONS ON A DAILY BASIS OR AS NEEDED THROUGHOUT THE WORK DAY. THE DISCHARGE OF ANY WATER CONTAMINATED BY WASTE PRODUCTS FROM CUTTING OPERATIONS TO THE STORM SEWER SYSTEM IS PROHIBITED.
11. PAVED AND IMPERVIOUS SURFACES WHICH ARE ADJACENT TO CONSTRUCTION SITES MUST BE SWEEPED ON A DAILY BASIS AND AS NEEDED DURING THE DAY WHEN SEDIMENT AND OTHER MATERIALS ARE TRACKED OR DISCHARGED ONTO THEM. EITHER SWEEPING BY HAND OR USE OF STREET SWEEPERS IS ACCEPTABLE. STREET SWEEPERS USING WATER WHILE SWEEPING IS PREFERRED IN ORDER TO MINIMIZE DUST. FLUSHING OFF PAVED SURFACES WITH WATER IS PROHIBITED.

|                                                                                                                                                                                                                                                                                                                                      |  |                       |      |             |          |                                                                                                                                                                     |  |                            |       |                      |  |                      |                   |                        |              |
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| Print Date: 9/17/2024 9:14 AM                                                                                                                                                                                                                                                                                                        |  | Sheet Revisions       |      |             |          | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans                  |       | PHASE 6A CIVIL NOTES |  |                      |                   | Project No./Code       |              |
| File Name: Civil Notes.dwg                                                                                                                                                                                                                                                                                                           |  | Rev.                  | Date | Comments    | Init.    |                                                                                                                                                                     |  | No Revisions:              |       |                      |  |                      |                   | TRG M535-014           |              |
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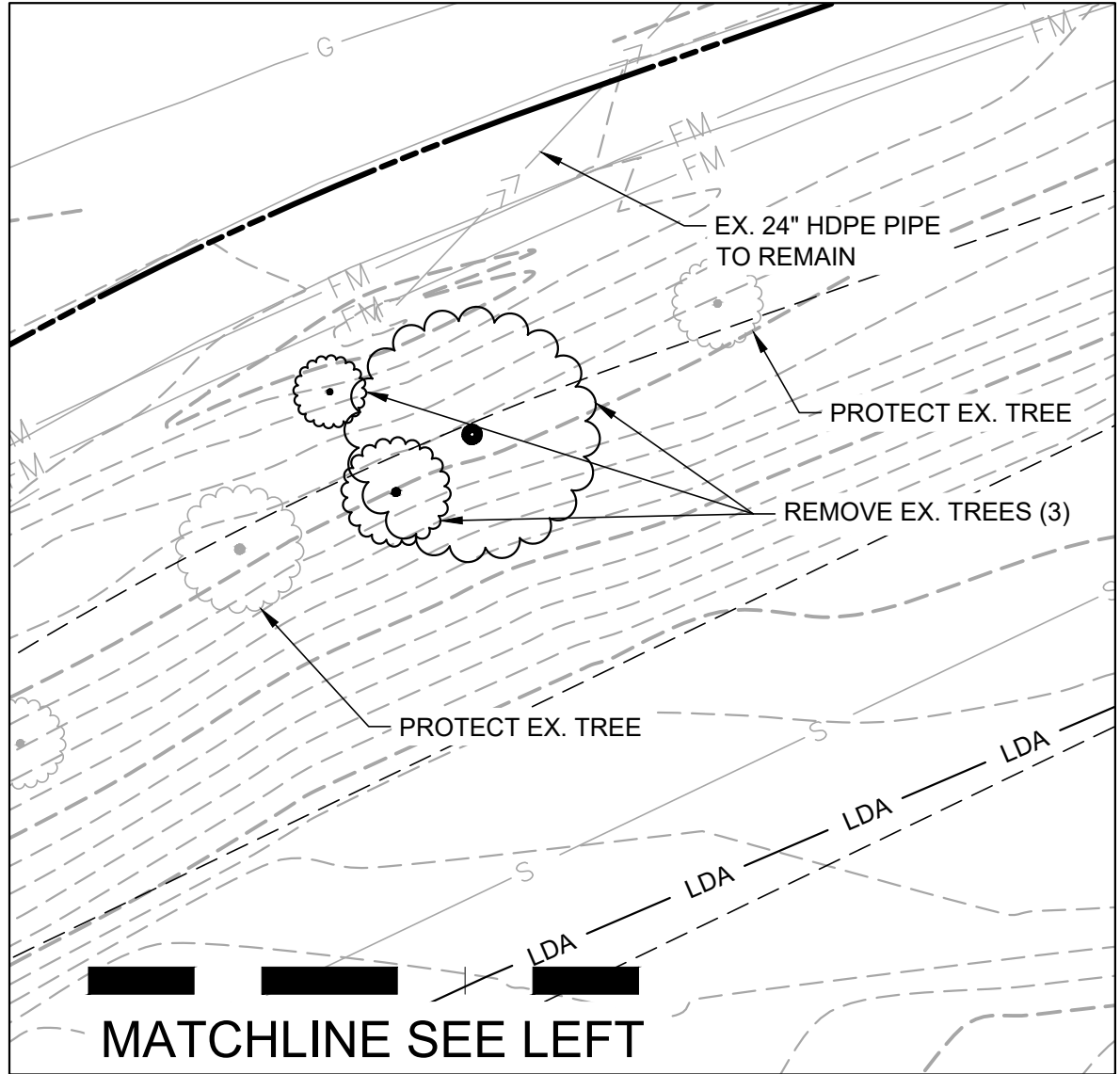
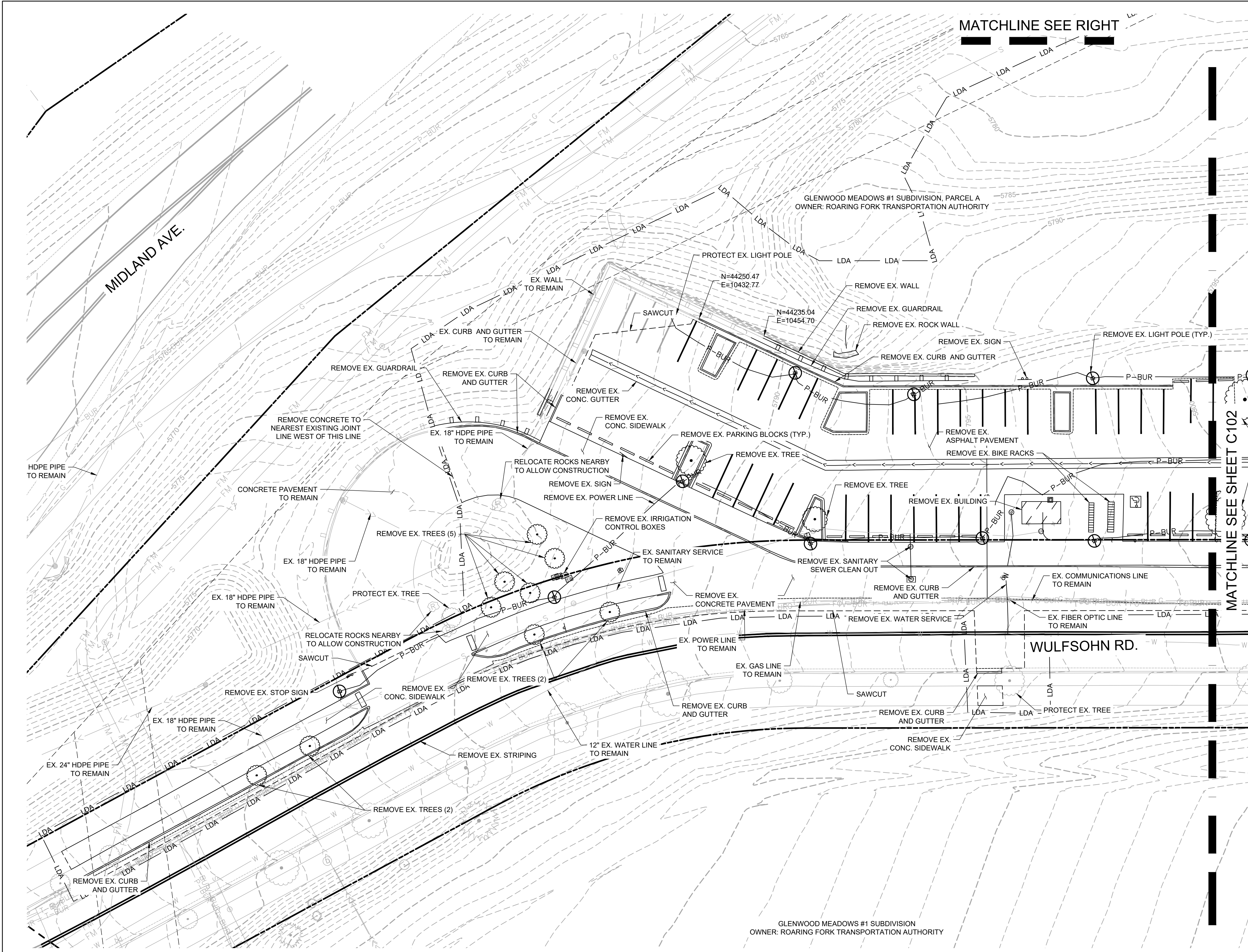
## LEGEND

|                                                                                     |                                          |                                                                                       |                                            |
|-------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------|
|    | ROW LINE                                 |    | PROPOSED WATER MAIN                        |
|    | LOT LINE                                 |    | PROPOSED SANITARY LINE                     |
|    | EASEMENT LINE                            |    | PROPOSED STORM PIPE                        |
|    | EXISTING CONTOUR                         |    | PROPOSED PLANTER AND TREE GRATE STORM PIPE |
|    | PROPOSED CONTOUR                         |    | PROPOSED GAS PIPE                          |
|    | EXISTING FENCE                           |    | PROPOSED BURIED TELEPHONE/FIBER            |
|    | EXISTING UNDERGROUND COMMUNICATIONS LINE |    | EXISTING GUARDRAIL                         |
|    | EXISTING UNDERGROUND TELEPHONE LINE      |    | PROPOSED GUARDRAIL                         |
|    | EXISTING GAS LINE                        |    | PROPOSED RETAINING WALL                    |
|    | EXISTING OVERHEAD POWER LINE             |    | PROPOSED CONCRETE PAVEMENT                 |
|    | EXISTING UNDERGROUND POWER LINE          |    | PROPOSED ASPHALT PAVEMENT                  |
|    | EXISTING FIBER OPTIC LINE                |    | PROPOSED SNOW STORAGE AREA                 |
|    | EXISTING STORM LINE                      |    | EXISTING RIPRAP                            |
|    | EXISTING FOUNDATION DRAIN                |    | PROPOSED RIPRAP                            |
|    | EXISTING WATER MAIN                      |    |                                            |
|    | EXISTING SANITARY LINE                   |    |                                            |
|    | EXISTING SANITARY FORCE MAIN             |    |                                            |
|    | EXISTING IRRIGATION LINE                 |    |                                            |
|    | EXISTING IRRIGATION CONTROL BOX          |    |                                            |
|    | EXISTING ELECTRIC VAULT                  |    |                                            |
|    | EXISTING ELECTRIC METER                  |    |                                            |
|    | EXISTING ELECTRIC PEDESTAL               |    |                                            |
|    | EXISTING ELECTRIC TRANSFORMER            |    |                                            |
|    | EXISTING ELECTRIC MANHOLE                |    |                                            |
|    | EXISTING FIBER OPTIC VAULT               |    |                                            |
|    | EXISTING COMMUNICATIONS PEDESTAL         |    |                                            |
|    | EXISTING POWER POLE                      |    |                                            |
|    | EXISTING WATER SHUTOFF                   |    |                                            |
|    | EXISTING IRRIGATION CONTROL VALVE        |    |                                            |
|    | EXISTING TREE                            |    |                                            |
|    | EXISTING LANDSCAPING ROCK                |   |                                            |
|    | EXISTING SANITARY CLEANOUT               |  |                                            |
|    | EXISTING WATER MANHOLE                   |  |                                            |
|    | EXISTING WATER VALVE                     |  |                                            |
|    | PROPOSED WATER VALVE                     |  |                                            |
|    | PROPOSED WATER THRUST BLOCK              |  |                                            |
|    | EXISTING SANITARY MANHOLE                |  |                                            |
|    | EXISTING FIRE HYDRANT                    |  |                                            |
|    | PROPOSED FIRE HYDRANT                    |  |                                            |
|    | EXISTING TRAFFIC SIGN                    |  |                                            |
|    | PROPOSED TRAFFIC SIGN                    |  |                                            |
|    | EXISTING STORM MANHOLE                   |                                                                                       |                                            |
|   | PROPOSED STORM MANHOLE                   |                                                                                       |                                            |
|  | EXISTING STORM INLET                     |                                                                                       |                                            |
|  | PROPOSED STORM INLET                     |                                                                                       |                                            |
|  | PROPOSED FLARED END SECTION              |                                                                                       |                                            |

|                                                                                                                                                                                                                                                                                         |  |                      |          |                            |       |                                                                                                                                                                     |  |                   |  |                      |                        |              |  |                  |  |
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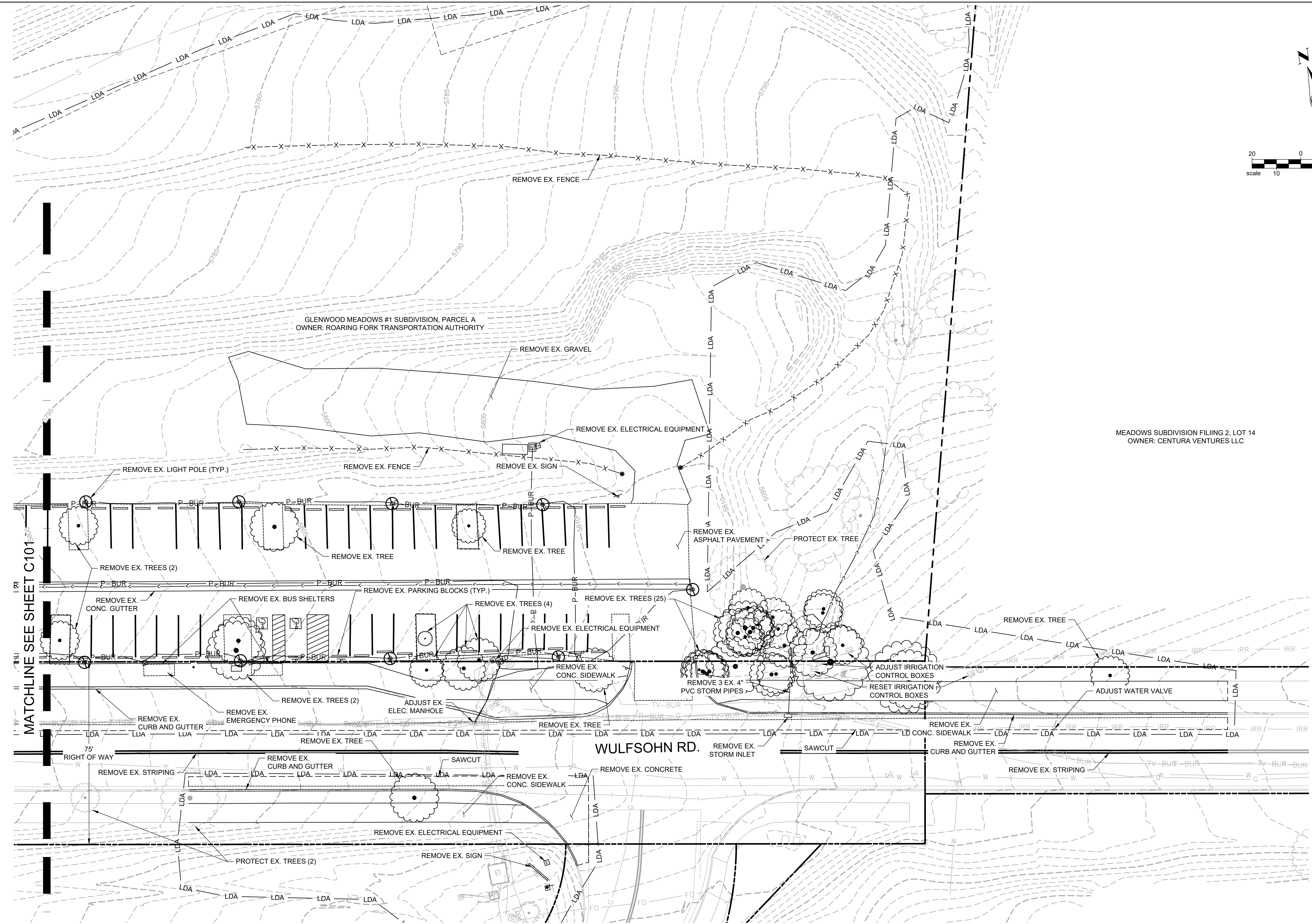
ROARING FORK TRANSPORTATION AUTHORITY  
**WEST GLENWOOD TRANSIT CENTER  
AND ADMINISTRATION OFFICES**  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     |  |
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| PHASE 6A DEMOLITION PLAN |                        |                   |  |
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| Designer:                | T. Nuetzel             | Structure Numbers |  |
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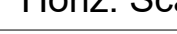
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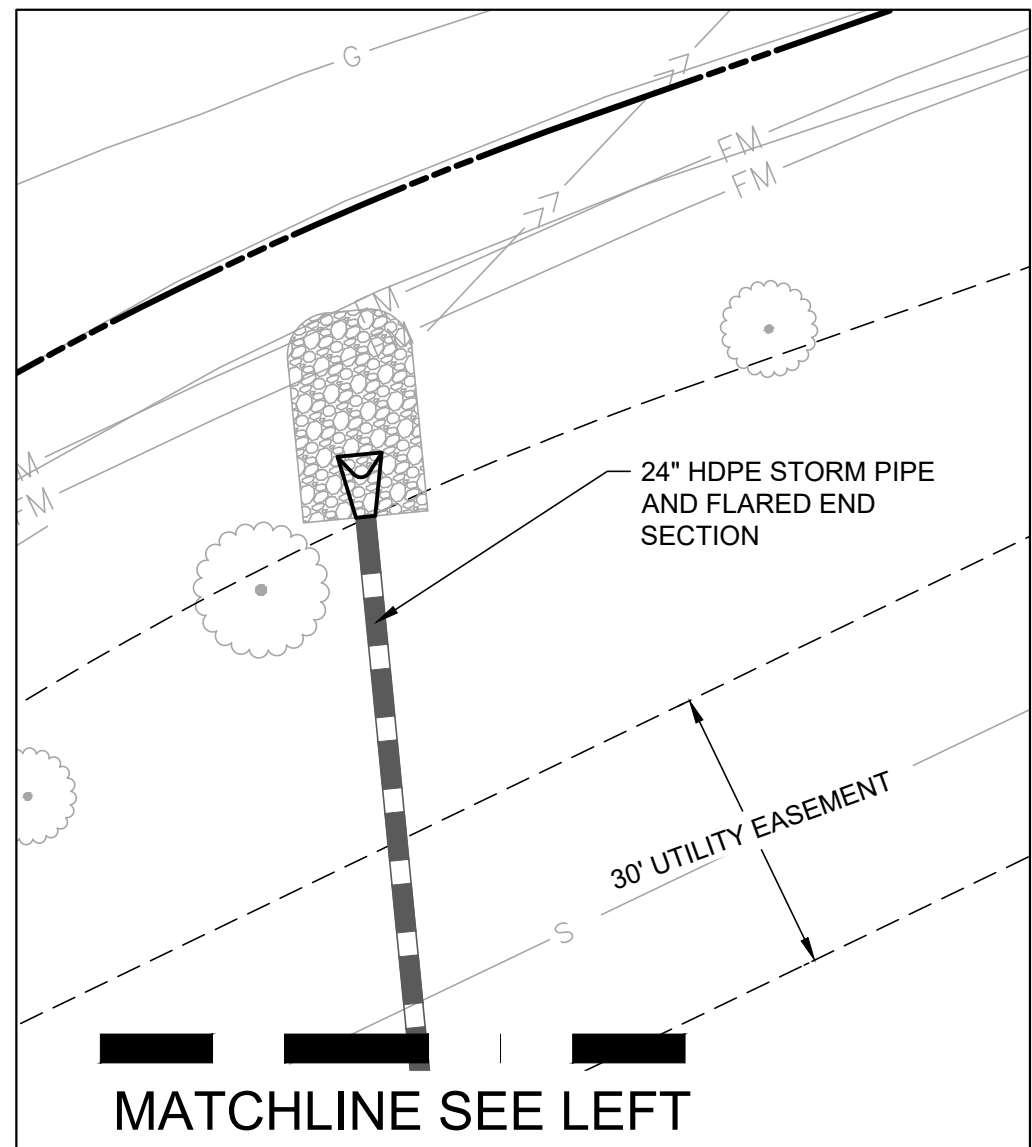
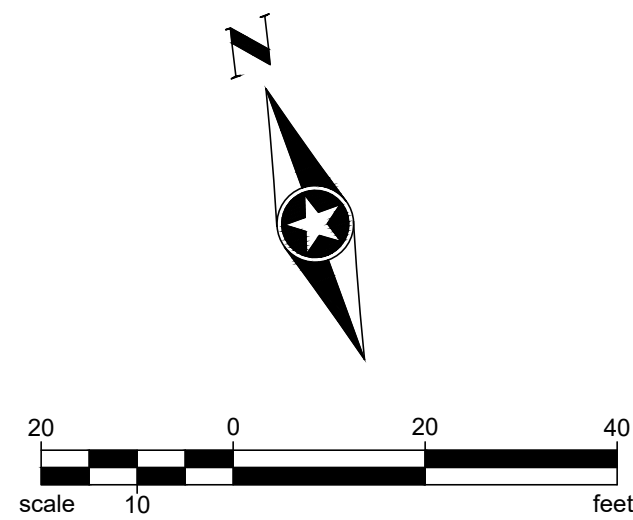
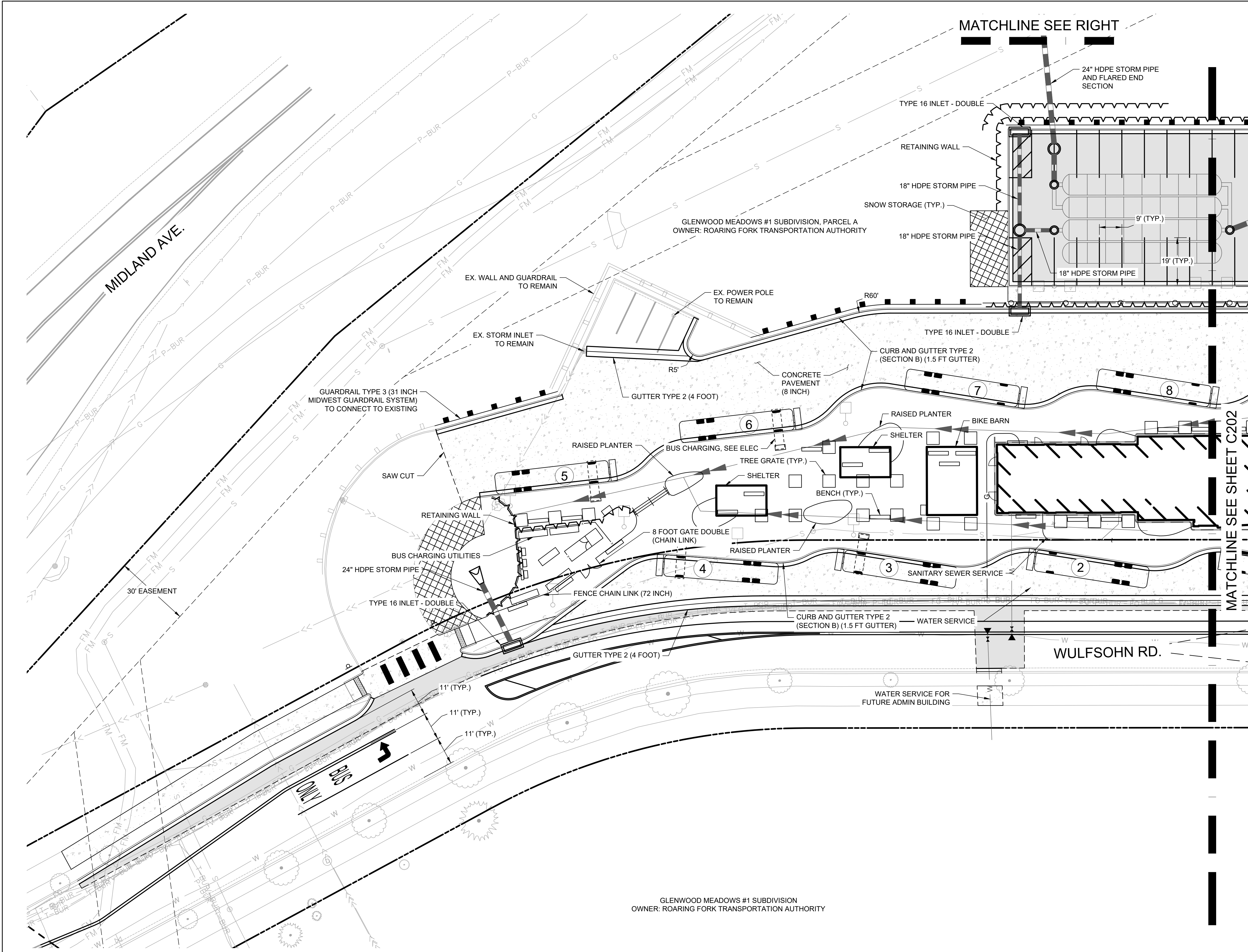
RIGHT OF WAY

WULFSOHN RD

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| File Name: PH 6A - Demolition Plan.dwg                                                                                                                                                                                                                                                                                         |  | Rev.                 | Date     | Comments                   | Init. |                                                                                                                                                                     |  | No Revisions: |  |                          |                   |              |  | TRG M535-014     |  |
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| Horiz. Scale:                                                                                                                                                                                                                                     | As Noted              |
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| <div><div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |                       |

| Sheet Revisions |          |                            |       |
|-----------------|----------|----------------------------|-------|
| Rev.            | Date     | Comments                   | Init. |
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ROARING FORK TRANSPORTATION AUTHORITY  
**WEST GLENWOOD TRANSIT CENTER  
AND ADMINISTRATION OFFICES**  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

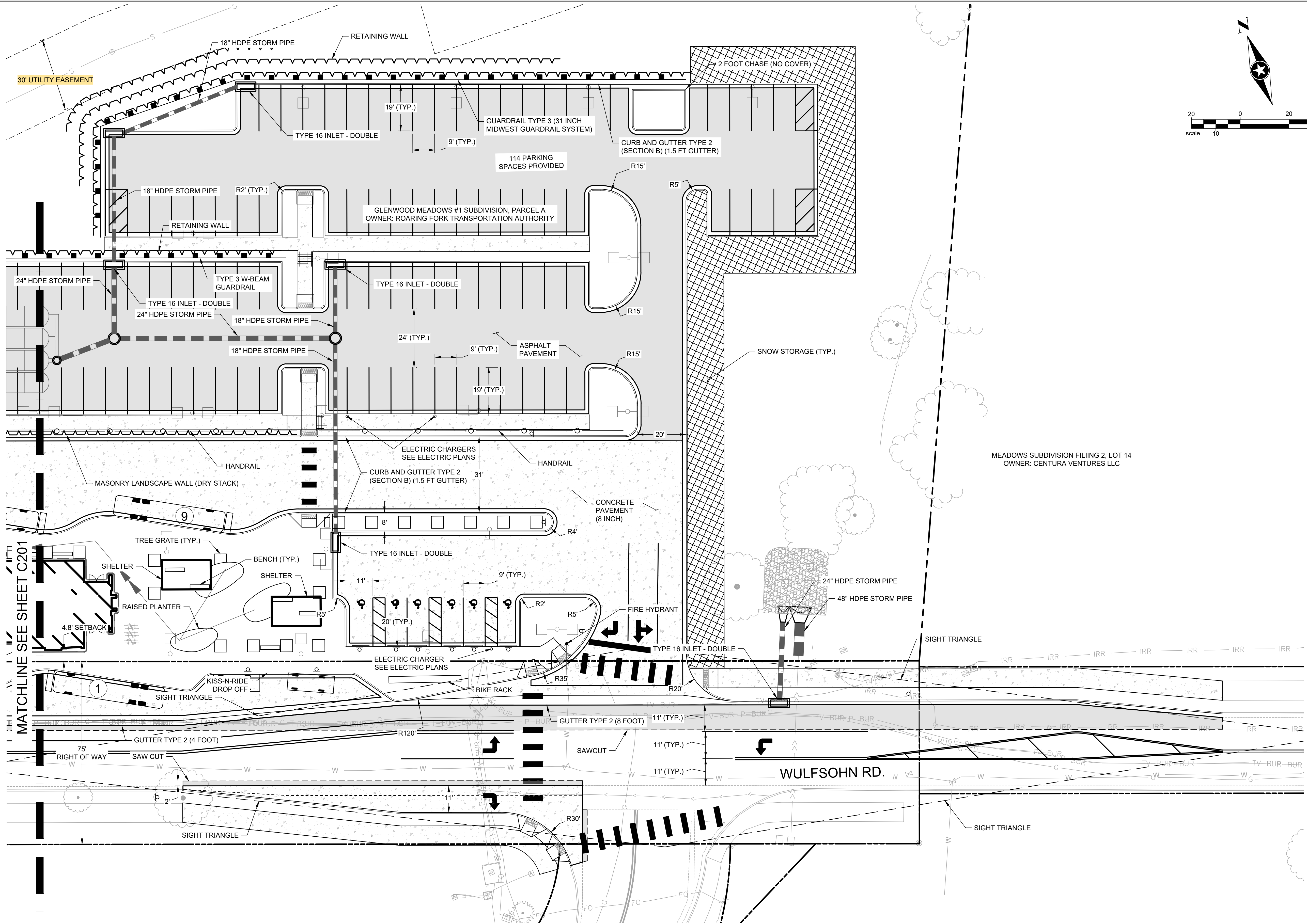
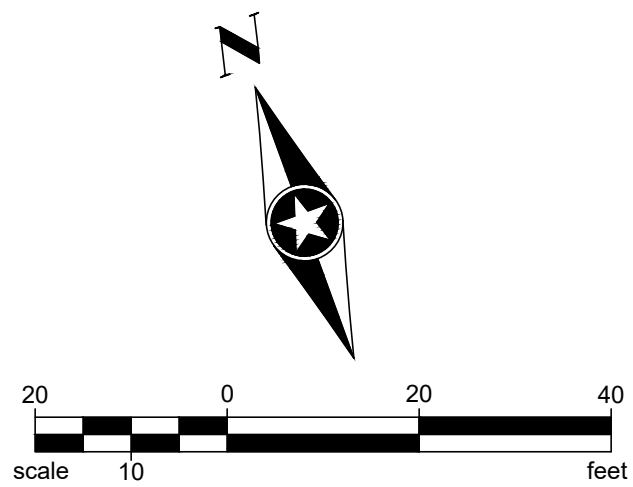
| FIR Plans     |
|---------------|
| No Revisions: |
| Revised:      |
| Void:         |

| PHASE 6A SITE PLAN |                        |                   |  |
|--------------------|------------------------|-------------------|--|
| Designer:          | T. Nuetzel             | Structure Numbers |  |
| Detailer:          | B. Risk                |                   |  |
| Sheet Subset:      | Subset Sheets: C201 of |                   |  |

| Project No./Code |
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| TRG M535-014     |
| 25924            |
| Sheet Number     |



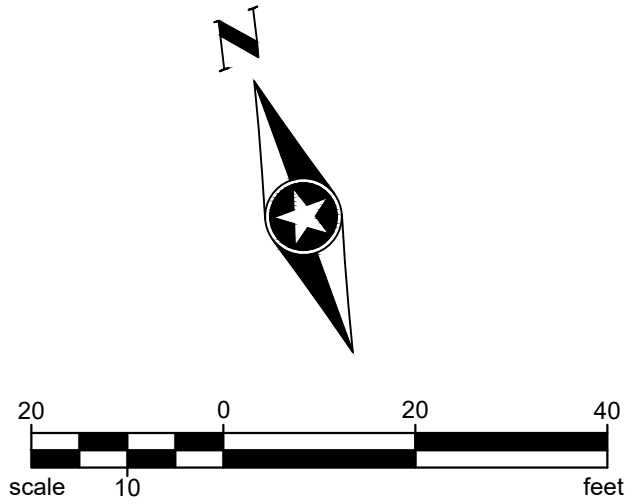
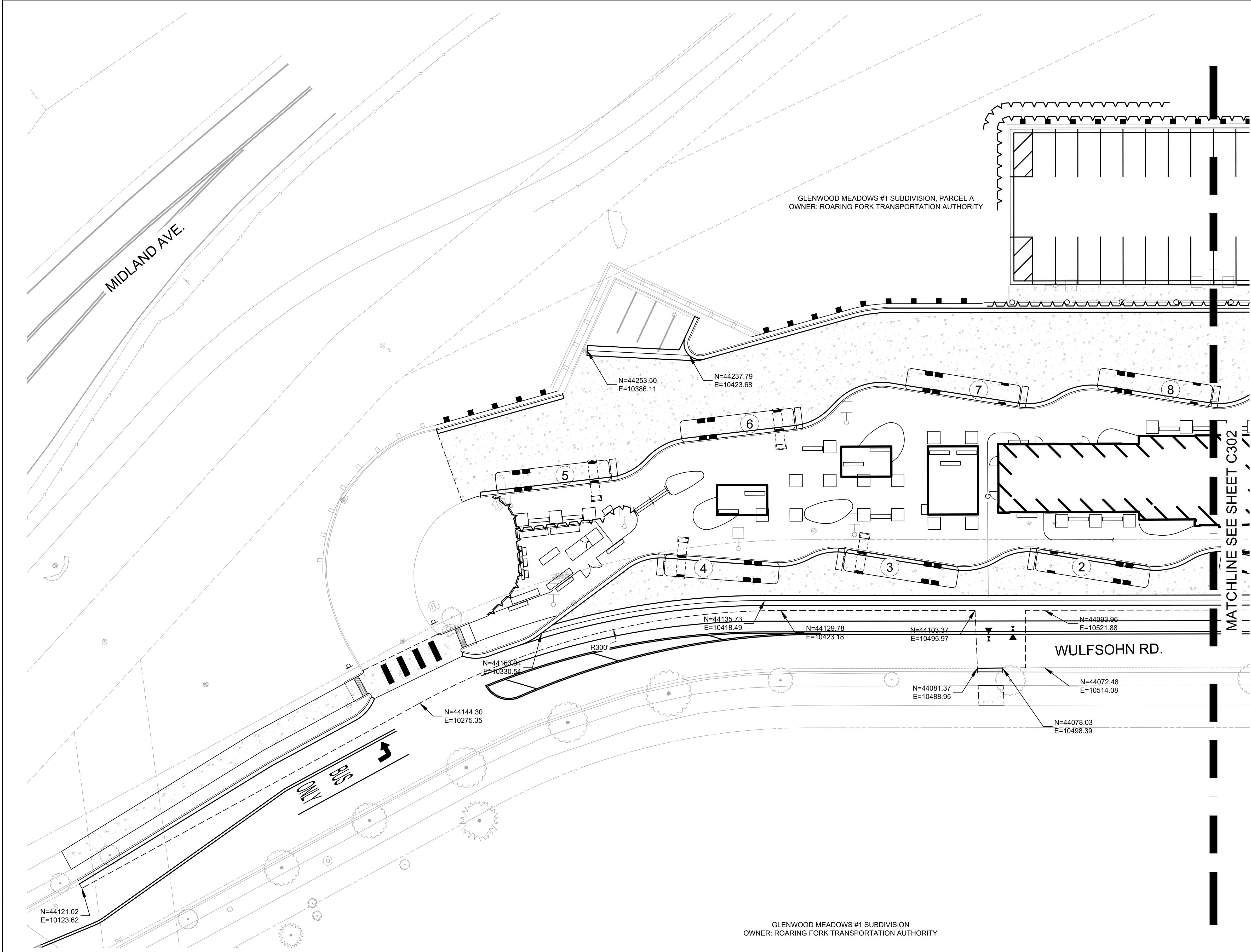
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| Print Date: 9/17/2024 9:16 AM                                                                                                                                                                                           |                       | Sheet Revisions |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A SITE PLAN   |  |  | Project No./Code       |  |
| File Name: PH 6A - Site Plan.dwg                                                                                                                                                                                        |                       | Rev.            | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  | Designer: T. Nuetzel |  |  | TRG M535-014           |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                  | Vert. Scale: As Noted |                 | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Detailer: B. Risk    |  |  | 25924                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900 |                       |                 |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Sheet Subset:        |  |  | Sheet Number           |  |
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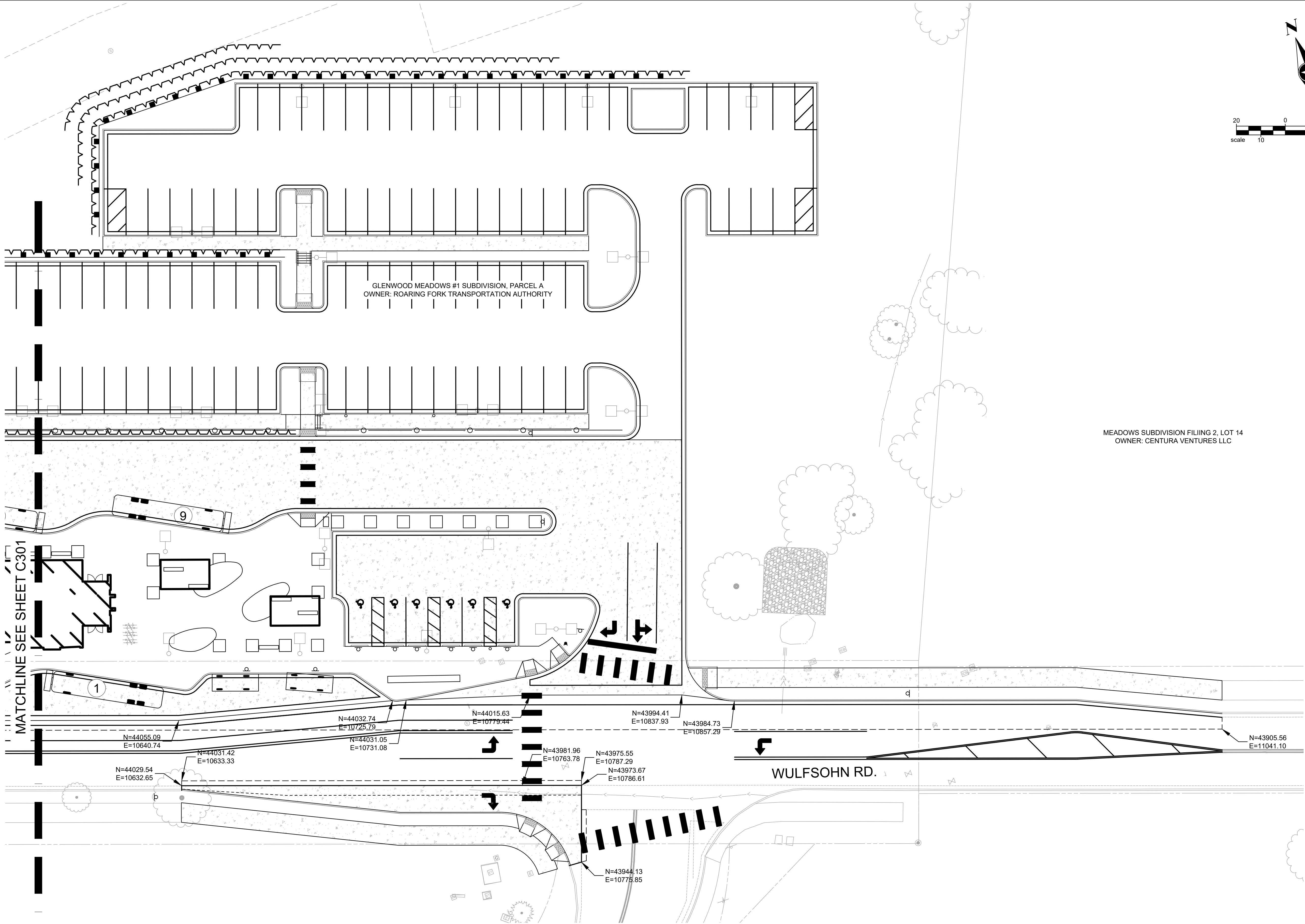
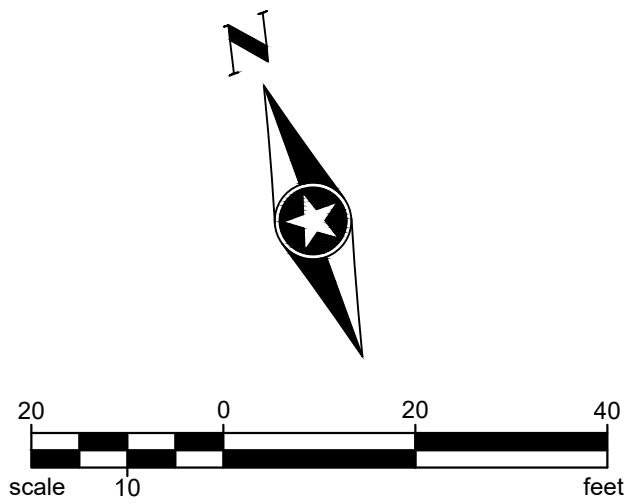


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|                                                                                                                                                                                                                                                                                         |                       |                       |          |                            |       |                                                                                                                                                                 |  |               |  |                                  |  |                        |                  |  |
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| Print Date: 9/17/2024 9:17 AM                                                                                                                                                                                                                                                           |                       | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A HORIZONTAL CONTROL PLAN |  |                        | Project No./Code |  |
| File Name: PH 6A - Horizontal Control Plan.dwg                                                                                                                                                                                                                                          |                       | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  | Designer: T. Nuetzel             |  | Structure Numbers      | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                                                  | Vert. Scale: As Noted | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Detailer: B. Risk                |  |                        | 25924            |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                       | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Sheet Subset:                    |  | Subset Sheets: C301 of | Sheet Number     |  |





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|                                                                                                                                                                                                                                                                                         |                       |                       |          |                            |       |                                                                                                                                                                 |               |  |                                  |                   |                        |                  |  |
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| Print Date: 9/17/2024 9:17 AM                                                                                                                                                                                                                                                           |                       | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 | FIR Plans     |  | PHASE 6A HORIZONTAL CONTROL PLAN |                   |                        | Project No./Code |  |
| File Name: PH 6A - Horizontal Control Plan.dwg                                                                                                                                                                                                                                          |                       | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 | No Revisions: |  | Designer: T. Nuetzel             |                   |                        | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                                                  | Vert. Scale: As Noted | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 | Revised:      |  | Detailer: B. Risk                | Structure Numbers |                        | 25924            |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                       | <input type="radio"/> |          |                            |       |                                                                                                                                                                 | Void:         |  | Sheet Subset:                    |                   | Subset Sheets: C302 of | Sheet Number     |  |



| LINE TABLE |        |         |                |               |              |             |
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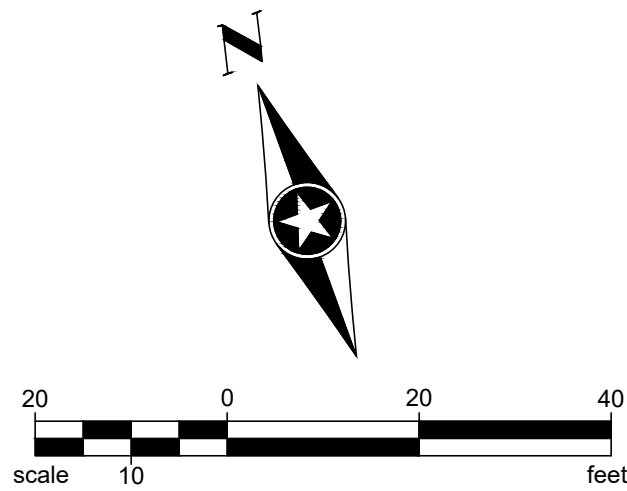
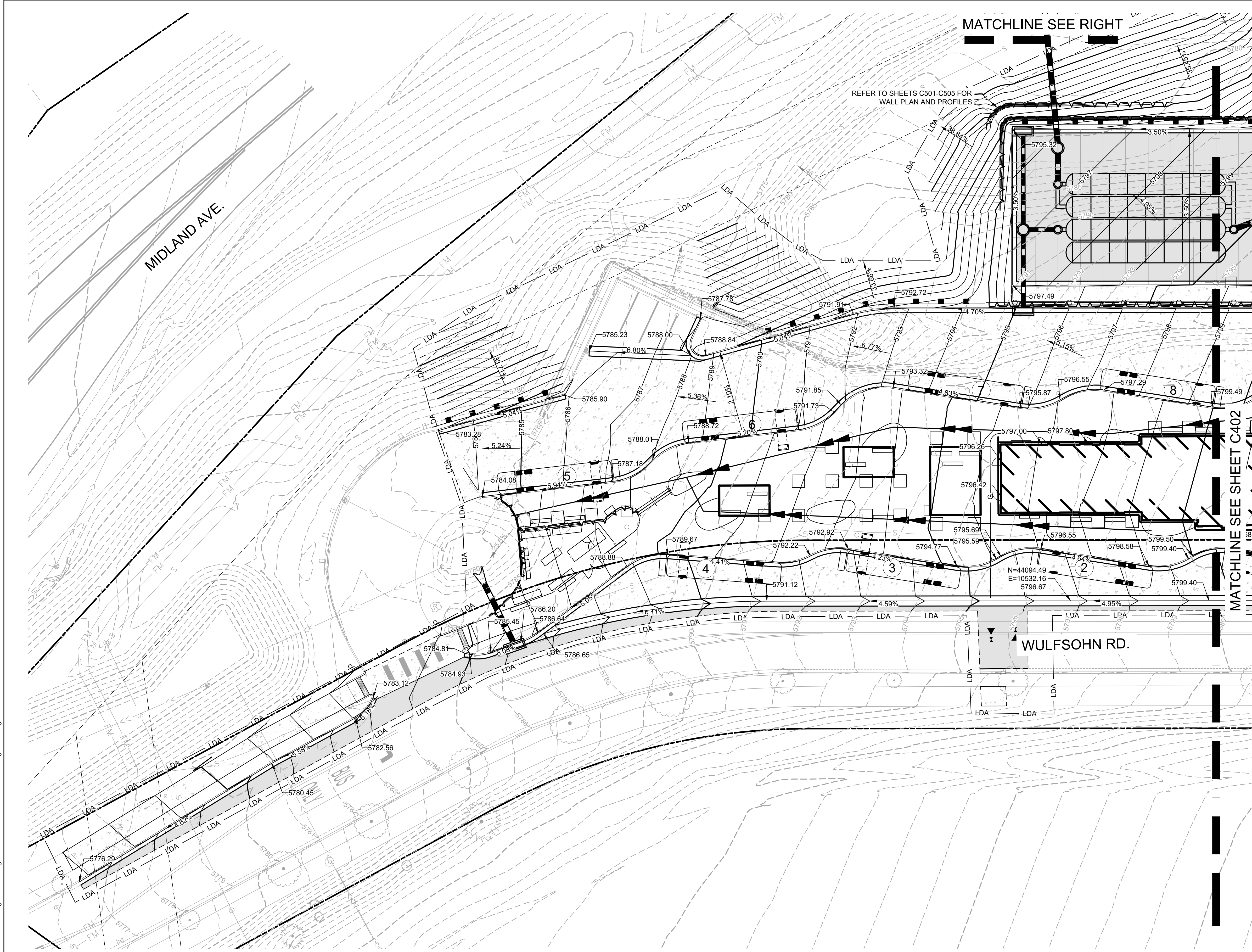
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| Print Date: 9/17/2024 9:17 AM                                                                                                                                                                                                                                                           | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 | FIR Plans     |  | PHASE 6A HORIZONTAL CONTROL PLAN |                        | Project No./Code |
| File Name: PH 6A - Horizontal Control Plan.dwg                                                                                                                                                                                                                                          | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 | No Revisions: |  |                                  |                        | TRG M535-014     |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                       | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |               |  |                                  |                        |                  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 | <input type="radio"/> |          |                            |       |                                                                                                                                                                 | Revised:      |  | Designer: T. Nuetzel             | Structure Numbers      | 25924            |
|                                                                                                                                                                                                                                                                                         | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |               |  | Detailer: B. Risk                |                        |                  |
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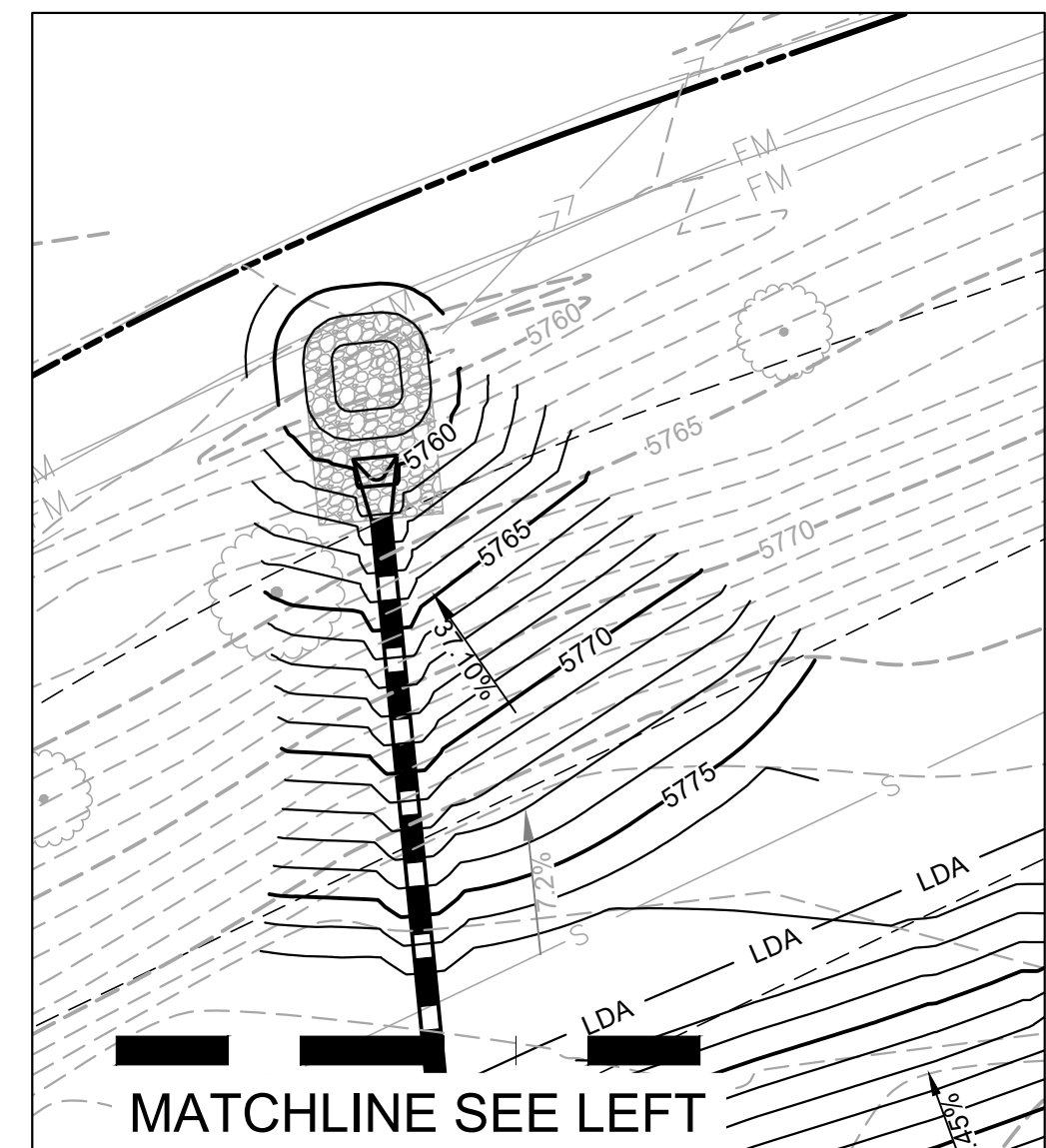


### LEGEND

FFE = FINISHED FLOOR ELEVATION  
LDA = LIMITS OF DISTURBED AREA

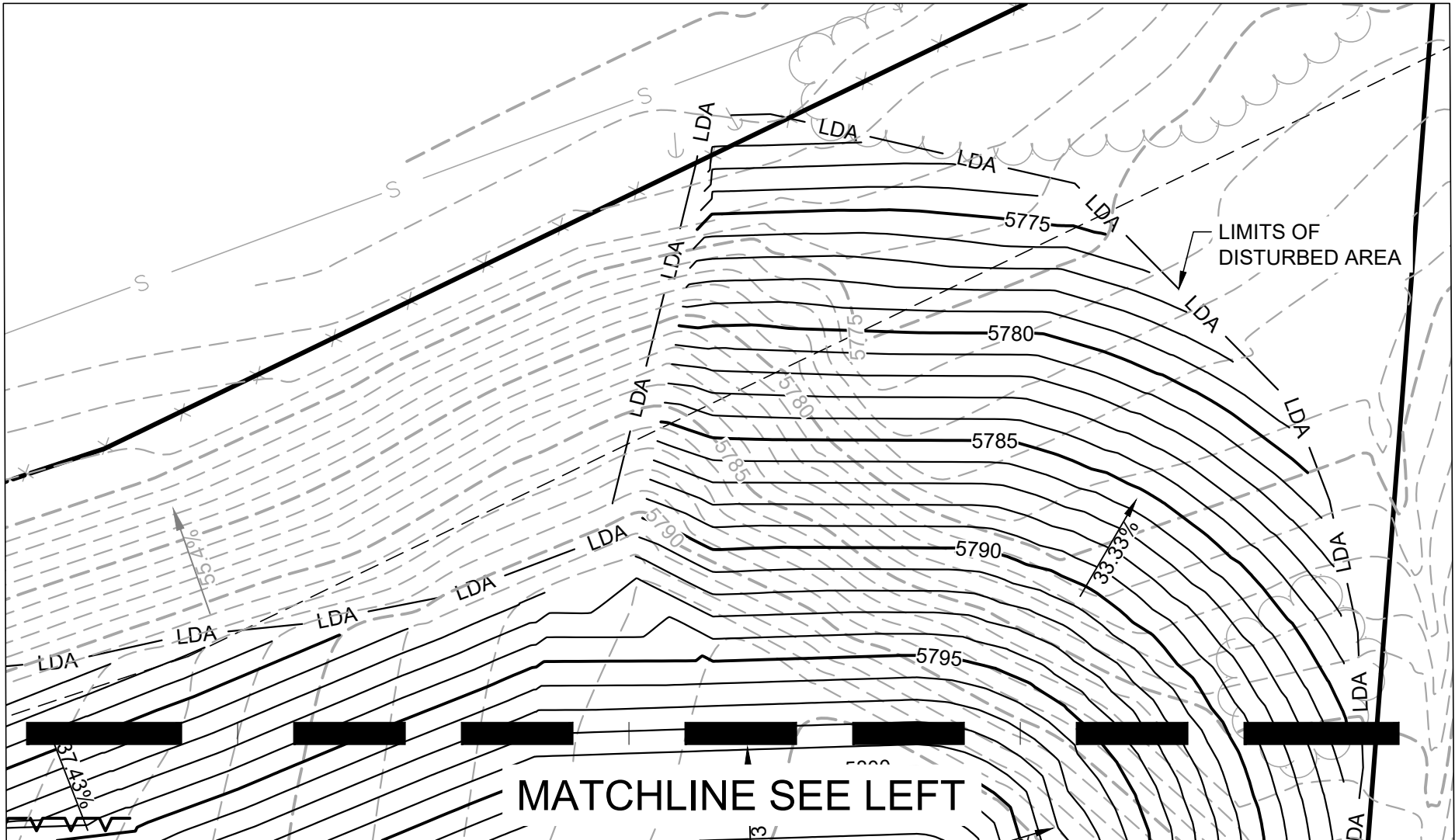
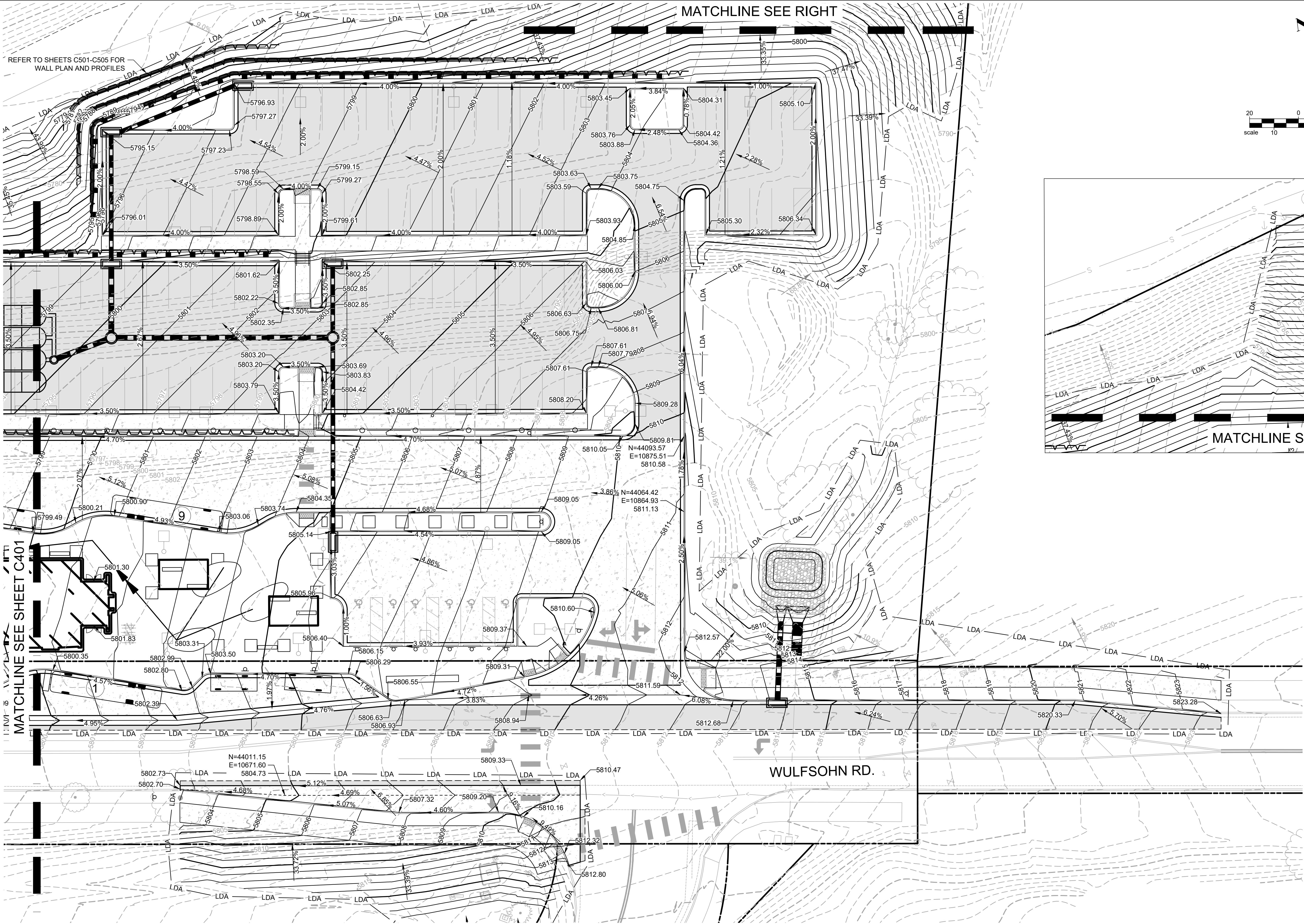
### GRADING NOTES

1. ALL ELEVATIONS AT CURB ARE FLOWLINE UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER SHOWN IS VERTICAL CURB AND GUTTER TYPE 2 (SECTION B) (1.5 FT. GUTTER).
3. ALL RAMPS AND WALKS TO BE INSTALLED PER CURRENT ADA REQUIREMENTS.
4. SEE UTILITY AND STORM PLANS FOR UTILITY COORDINATES.



|                                                                                                                                                                                                                         |  |                 |          |                            |                                                  |                                                                    |           |               |                                                            |  |  |                  |  |
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| Print Date: 9/17/2024 9:19 AM                                                                                                                                                                                           |  | Sheet Revisions |          |                            | ROARING FORK TRANSPORTATION AUTHORITY            |                                                                    | FIR Plans |               | PHASE 6A GRADING PLAN                                      |  |  | Project No./Code |  |
| File Name: PH 6A - Grading Plan.dwg                                                                                                                                                                                     |  | Rev.            | Date     | Comments                   | Init.                                            | <b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b> |           | No Revisions: | Designer: T. Nuetzel<br>Detailer: B. Risk<br>Sheet Subset: |  |  | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                  |  |                 | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR                                            |                                                                    |           | Revised:      |                                                            |  |  | 25924            |  |
| Vert. Scale: As Noted                                                                                                                                                                                                   |  |                 |          |                            |                                                  |                                                                    |           | Void:         |                                                            |  |  | Sheet Number     |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900 |  |                 |          |                            | 2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |                                                                    |           |               | Subset Sheets: C401 of                                     |  |  |                  |  |
| Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801                                                                                                                                                            |  |                 |          |                            |                                                  |                                                                    |           |               |                                                            |  |  |                  |  |





### LEGEND

FFE = FINISHED FLOOR ELEVATION  
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### GRADING NOTES

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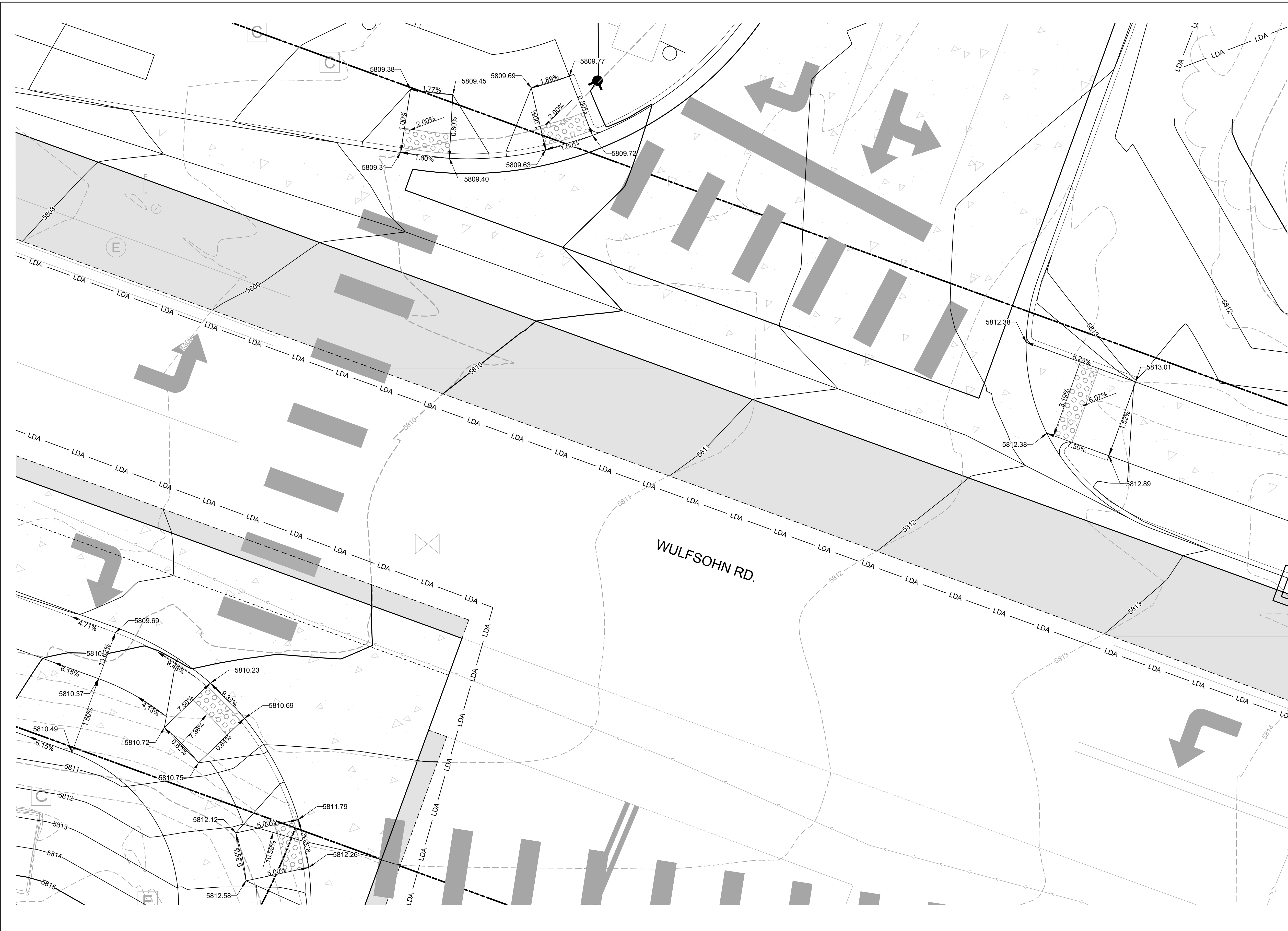
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| Horiz. Scale:                                                                                                                                                                                                                                                                           | As Noted                 |
| Vert. Scale:                                                                                                                                                                                                                                                                            | As Noted                 |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                          |

| Sheet Revisions |          |                            |       |
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| Rev.            | Date     | Comments                   | Init. |
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ROARING FORK TRANSPORTATION AUTHORITY  
**WEST GLENWOOD TRANSIT CENTER  
AND ADMINISTRATION OFFICES**  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     |  | PHASE 6A GRADING PLAN |  | Project No./Code |
|---------------|--|-----------------------|--|------------------|
| No Revisions: |  | Designer: T. Nuetzel  |  | TRG M535-014     |
| Revised:      |  | Detailer: B. Risk     |  | 25924            |
| Void:         |  | Sheet Subset:         |  | Sheet Number     |



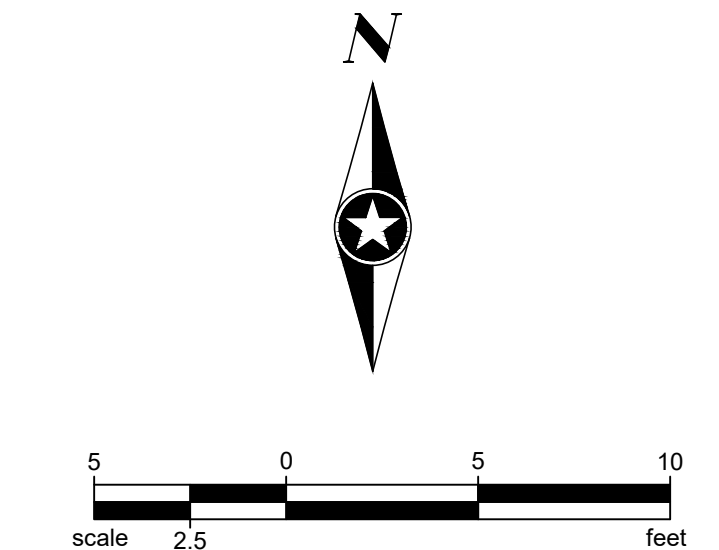
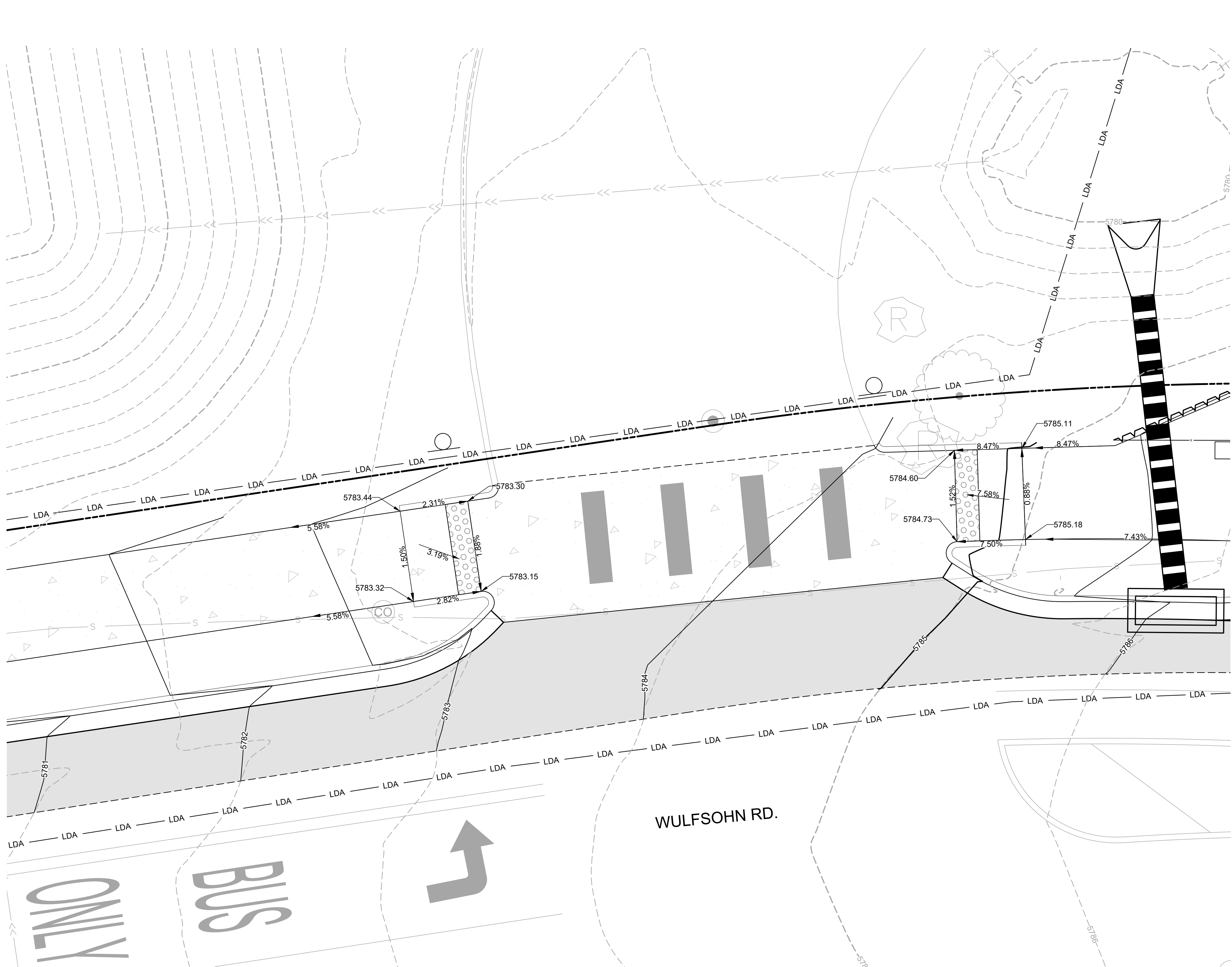


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- ## GRADING NOTES
1. ALL ELEVATIONS AT CURB ARE FLOWLINE UNLESS OTHERWISE NOTED.
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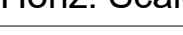


**LEGEND**

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**GRADING NOTES**

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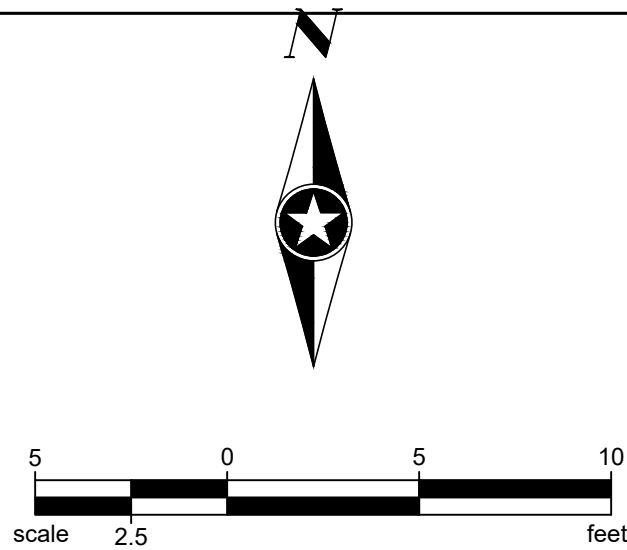
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| Print Date: 9/17/2024 9:19 AM                                                                                                                                                                                                                                                           |  | Sheet Revisions          |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |                        | PHASE 6A DETAILED GRADING PLAN |                   |              | Project No./Code |       |
| File Name: PH 6A - Grading Plan.dwg                                                                                                                                                                                                                                                     |  |                          |          |                            |       |                                                                                                                                                                 |  | Rev.          | Date                   |                                |                   |              | Comments         | Init. |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                       |  | <input type="checkbox"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |                        | Designer: T. Nuetzel           | Structure Numbers | 25924        |                  |       |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |  | <input type="checkbox"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |                        | Detailer: B. Risk              |                   | Sheet Number |                  |       |
|                                                                                                                                                                                                                                                                                         |  | <input type="checkbox"/> |          |                            |       |                                                                                                                                                                 |  | Sheet Subset: | Subset Sheets: C404 of |                                |                   |              |                  |       |
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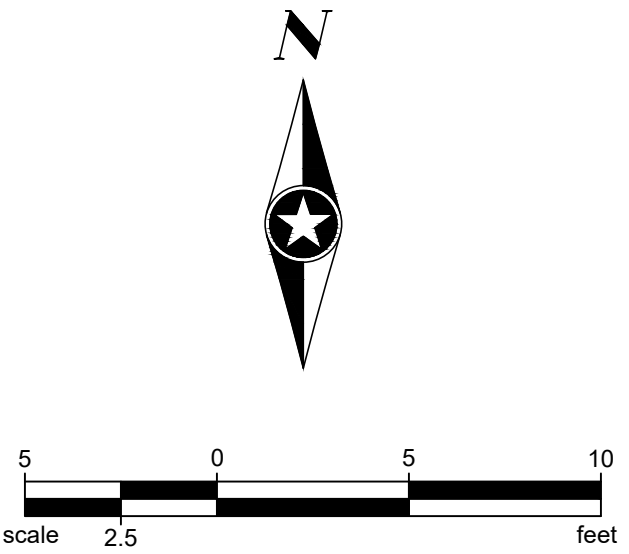
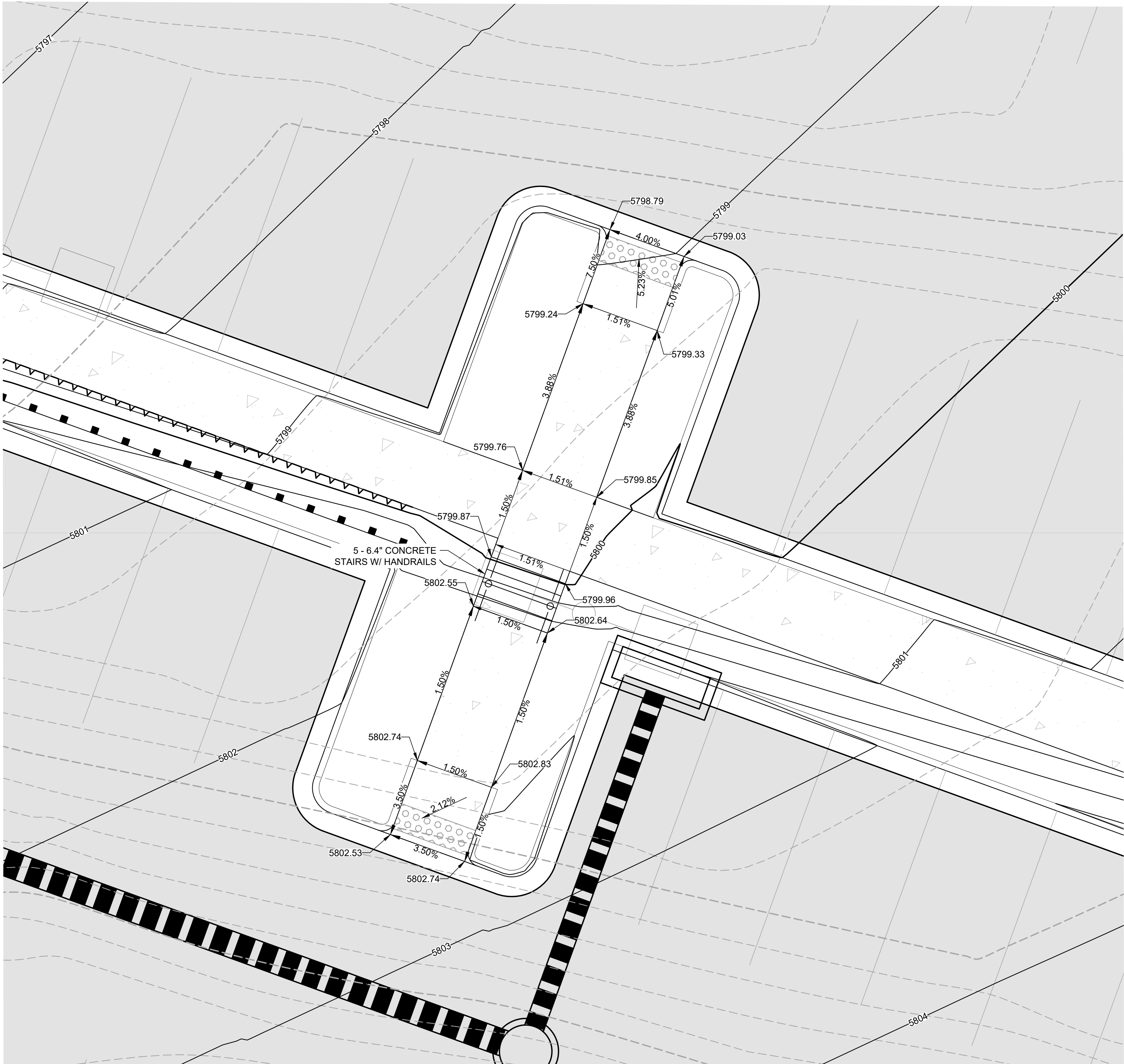


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Packet Page 461





LEGEND

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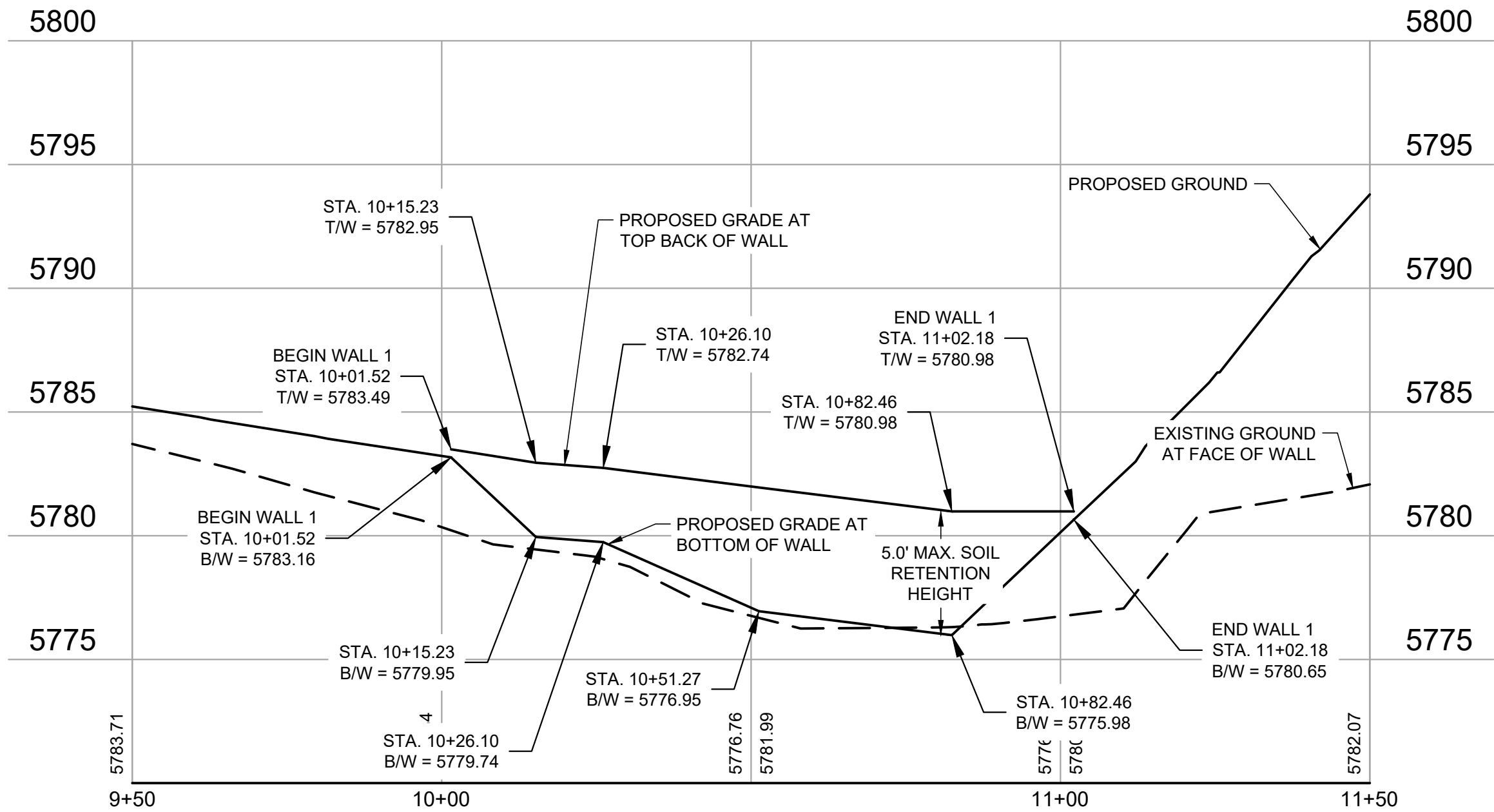
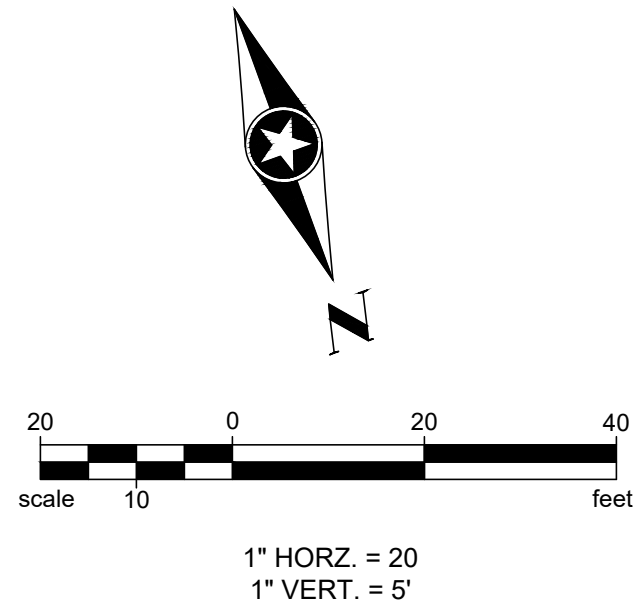
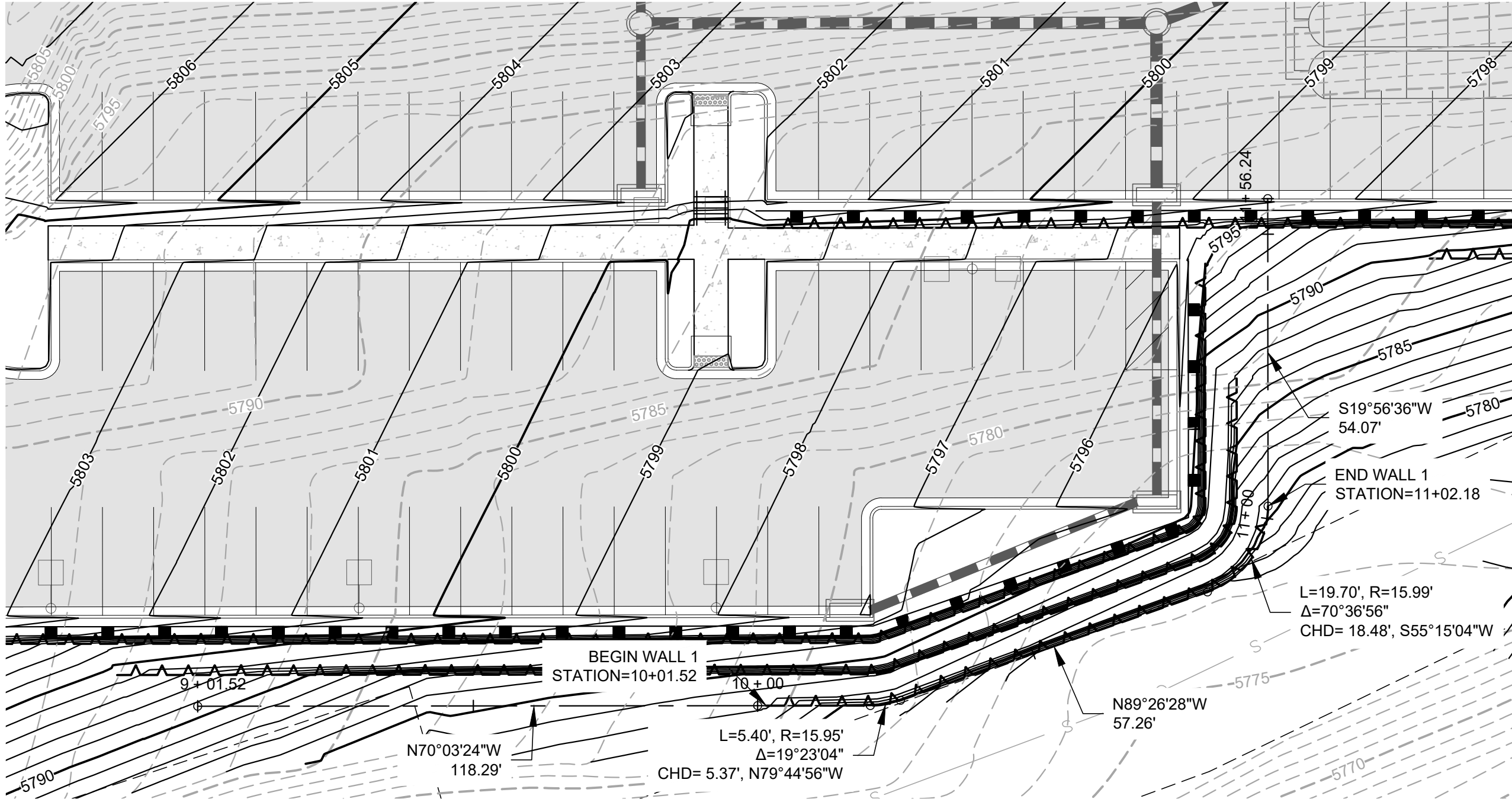
GRADING NOTES

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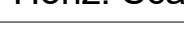
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| Print Date: 9/17/2024 9:20 AM                                                                                                                                                                                                                                                           |                       | Sheet Revisions      |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A DETAILED GRADING PLAN |                        |  | Project No./Code |  |
| File Name: PH 6A - Grading Plan.dwg                                                                                                                                                                                                                                                     |                       | Rev.                 | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                                |                        |  | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                                                  | Vert. Scale: As Noted | <input type="text"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Designer: T. Nuetzel           | Structure Numbers      |  | 25924            |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                       | <input type="text"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Detailer: B. Risk              |                        |  | Sheet Number     |  |
|                                                                                                                                                                                                                                                                                         |                       | <input type="text"/> |          |                            |       |                                                                                                                                                                 |  |               |  | Sheet Subset:                  | Subset Sheets: C407 of |  |                  |  |

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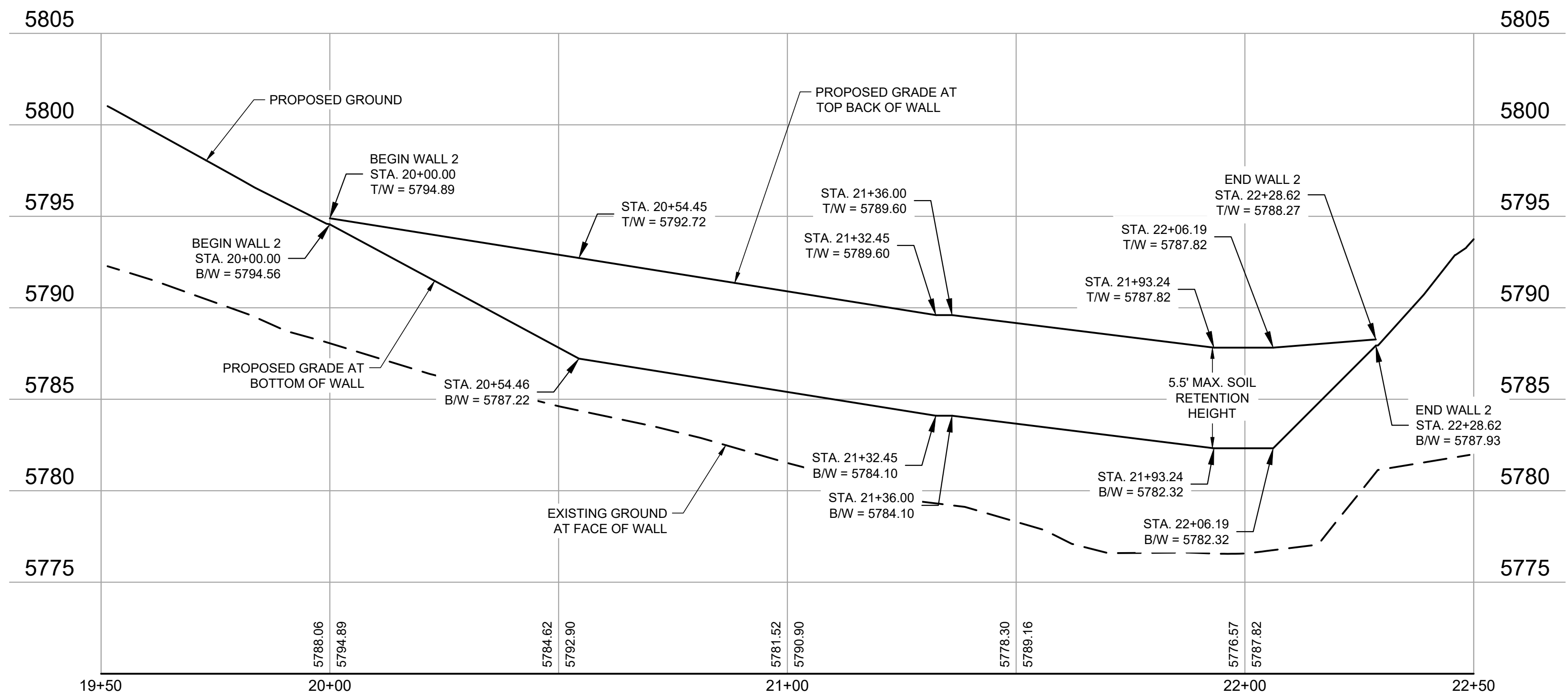
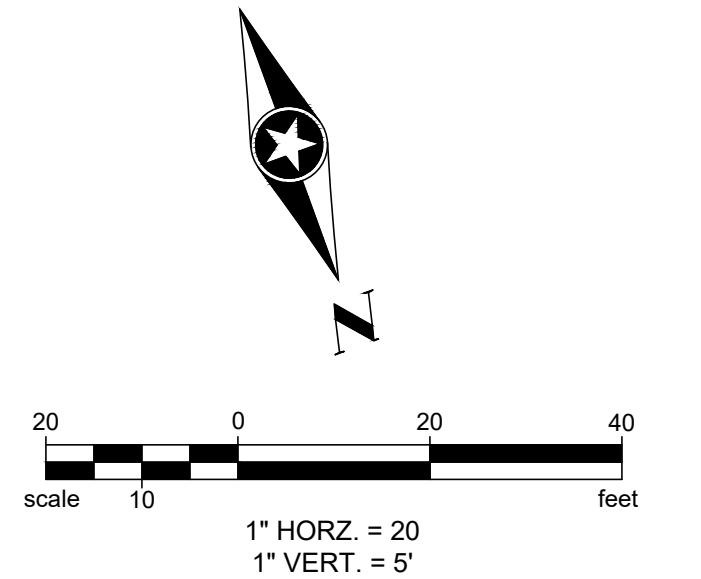
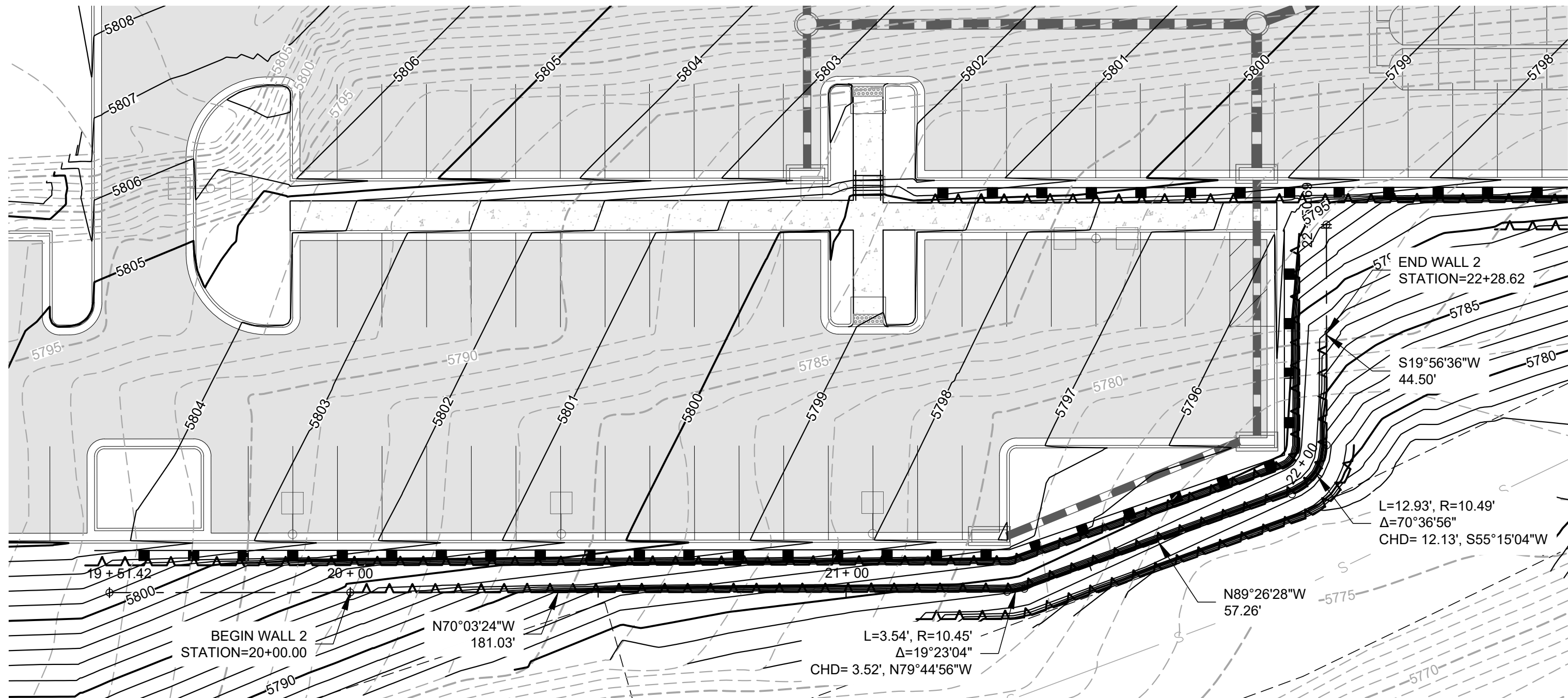




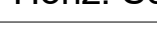
- NOTES:
- ALIGNMENT AND PROFILE ARE AT THE FACE OF WALL.
  - SEE STRUCTURAL SHEETS FOR WALL DETAILS.
- T/W = PROPOSED GRADE AT TOP BACK OF WALL  
B/W = PROPOSED GRADE AT BOTTOM OF WALL

|                                                                                                                                                                                                                                                                                                                                      |  |                       |          |                            |       |                                                                                                                                                                 |  |               |  |                                  |                   |              |  |                  |  |
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| Print Date: 9/17/2024 9:33 AM                                                                                                                                                                                                                                                                                                        |  | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A WALL 1 PLAN AND PROFILE |                   |              |  | Project No./Code |  |
| File Name: PH 6A - Wall Plan and Profile.dwg                                                                                                                                                                                                                                                                                         |  | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                                  |                   |              |  | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                                                    |  | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Designer: T. Nuetzel             | Structure Numbers | 25924        |  |                  |  |
| <div><div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Detailer: B. Risk                |                   | Sheet Number |  |                  |  |
|                                                                                                                                                                                                                                                                                                                                      |  | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Sheet Subset: |  | Subset Sheets: C501 of           |                   |              |  |                  |  |

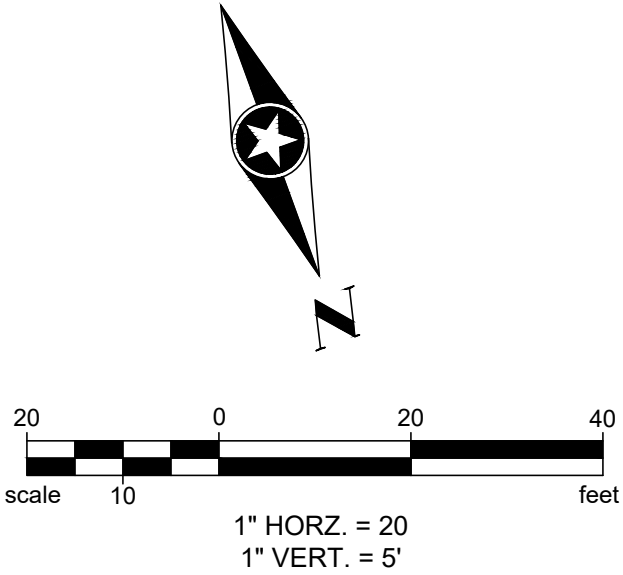




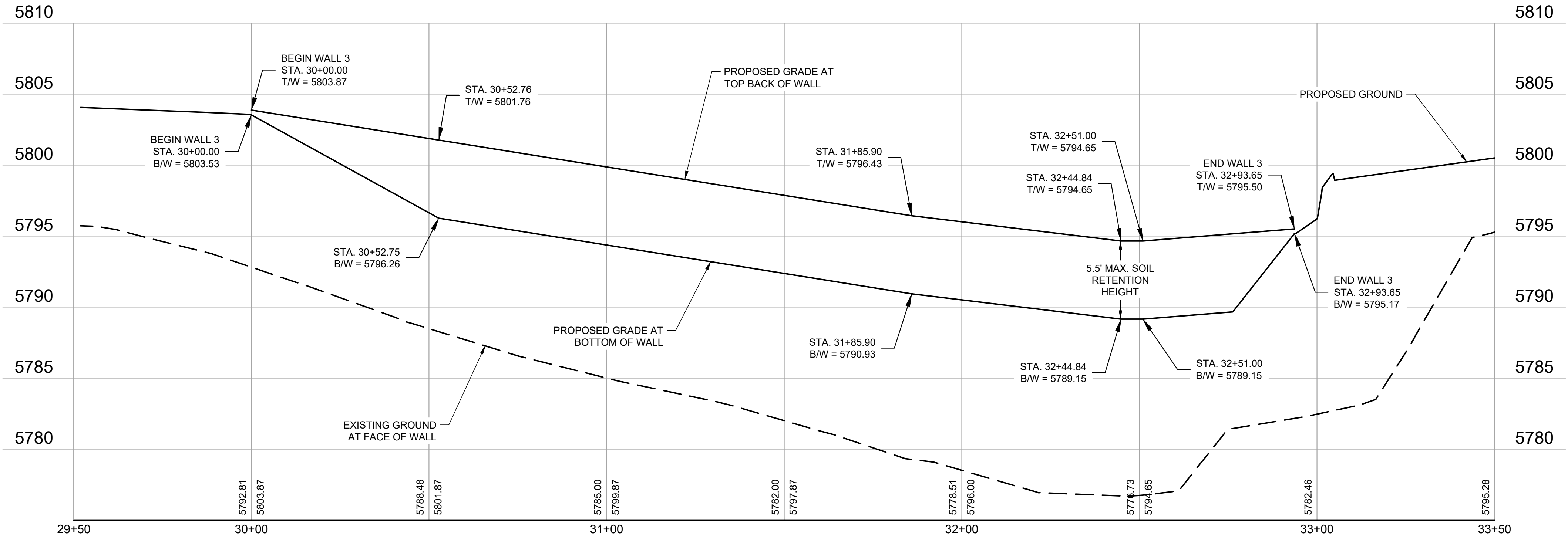
- NOTES:
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B/W = PROPOSED GRADE AT BOTTOM OF WALL

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| Print Date: 9/17/2024 9:33 AM                                                                                                                                                                                                                                                           |  | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A WALL 2 PLAN AND PROFILE |                   |              |  | Project No./Code       |  |
| File Name: PH 6A - Wall Plan and Profile.dwg                                                                                                                                                                                                                                            |  | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                                  |                   |              |  | TRG M535-014           |  |
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|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |  | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Detailer: B. Risk                |                   | Sheet Number |  |                        |  |
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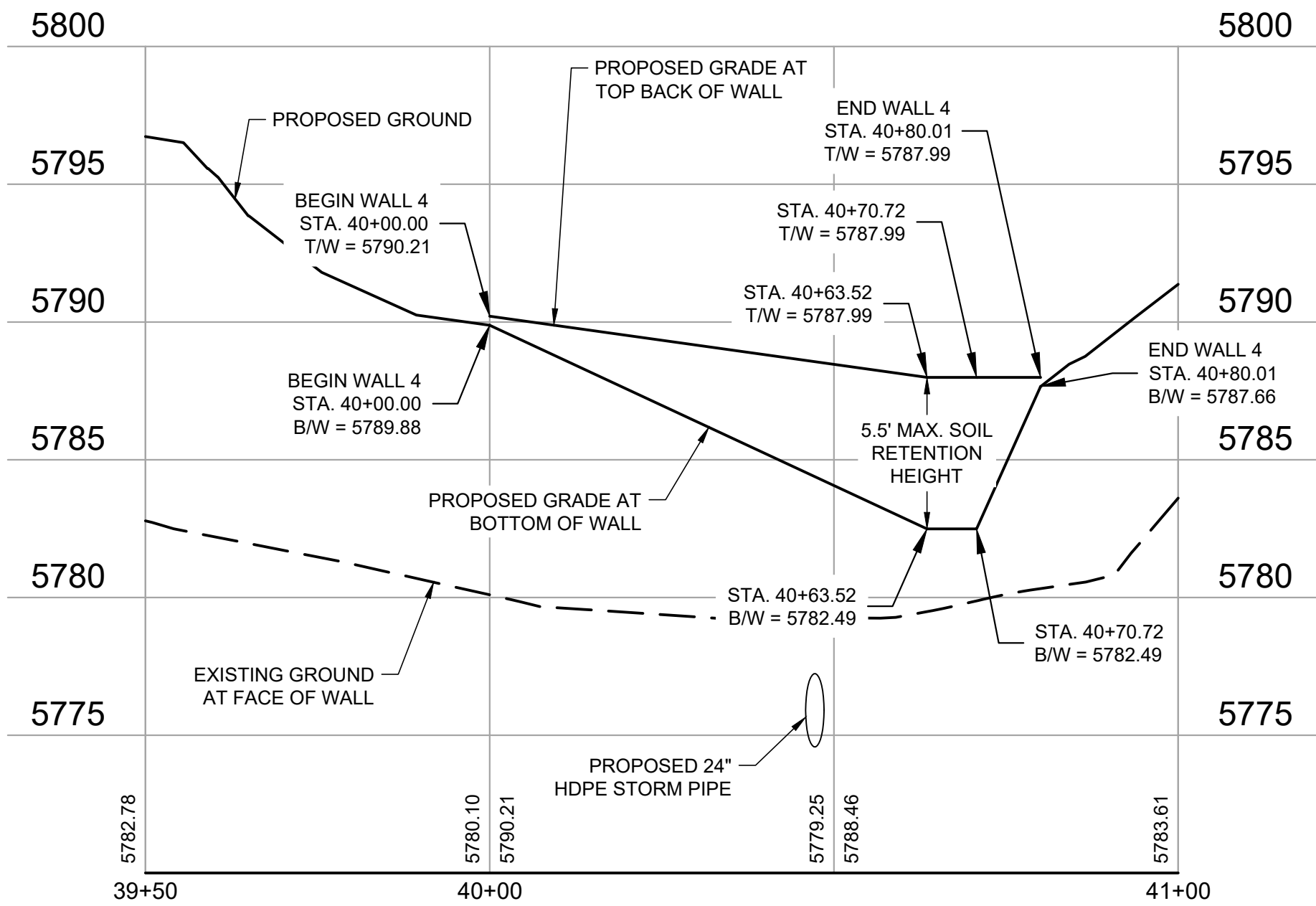
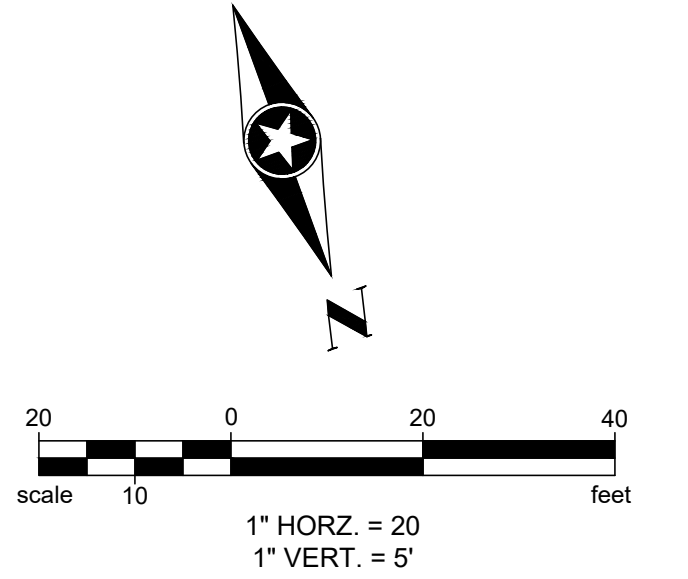
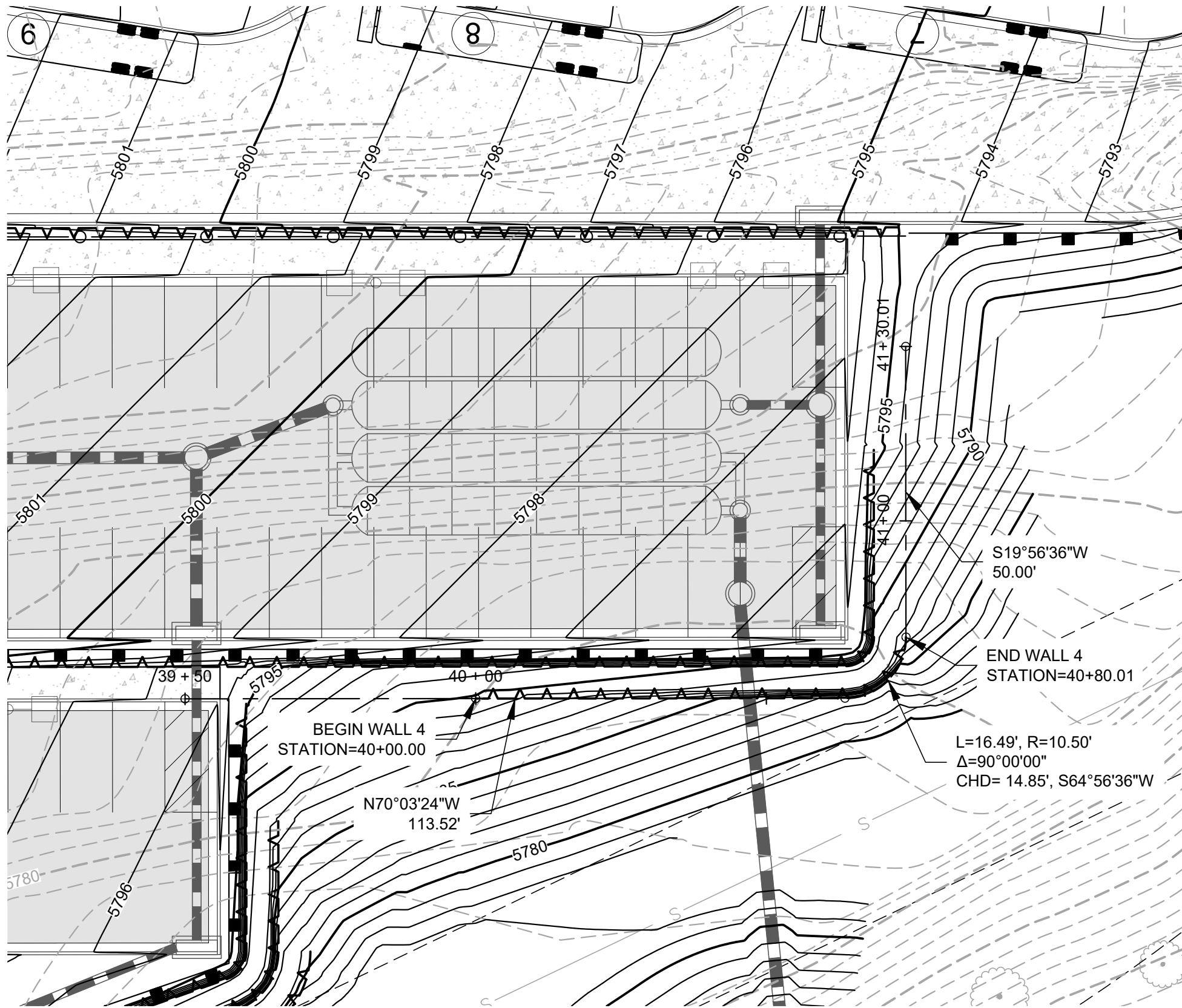
- NOTES:
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B/W = PROPOSED GRADE AT BOTTOM OF WALL



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| File Name: PH 6A - Wall Plan and Profile.dwg                                                                                                                                                                                                                                            |  | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                                  |           |                        |              | TRG M535-014     |  |
| Horiz. Scale: As Noted                      Vert. Scale: As Noted                                                                                                                                                                                                                       |  | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Designer: T. Nuetzel             | Structure |                        | 25924        |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |  | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Detailer: B. Risk                | Numbers   |                        | Sheet Number |                  |  |
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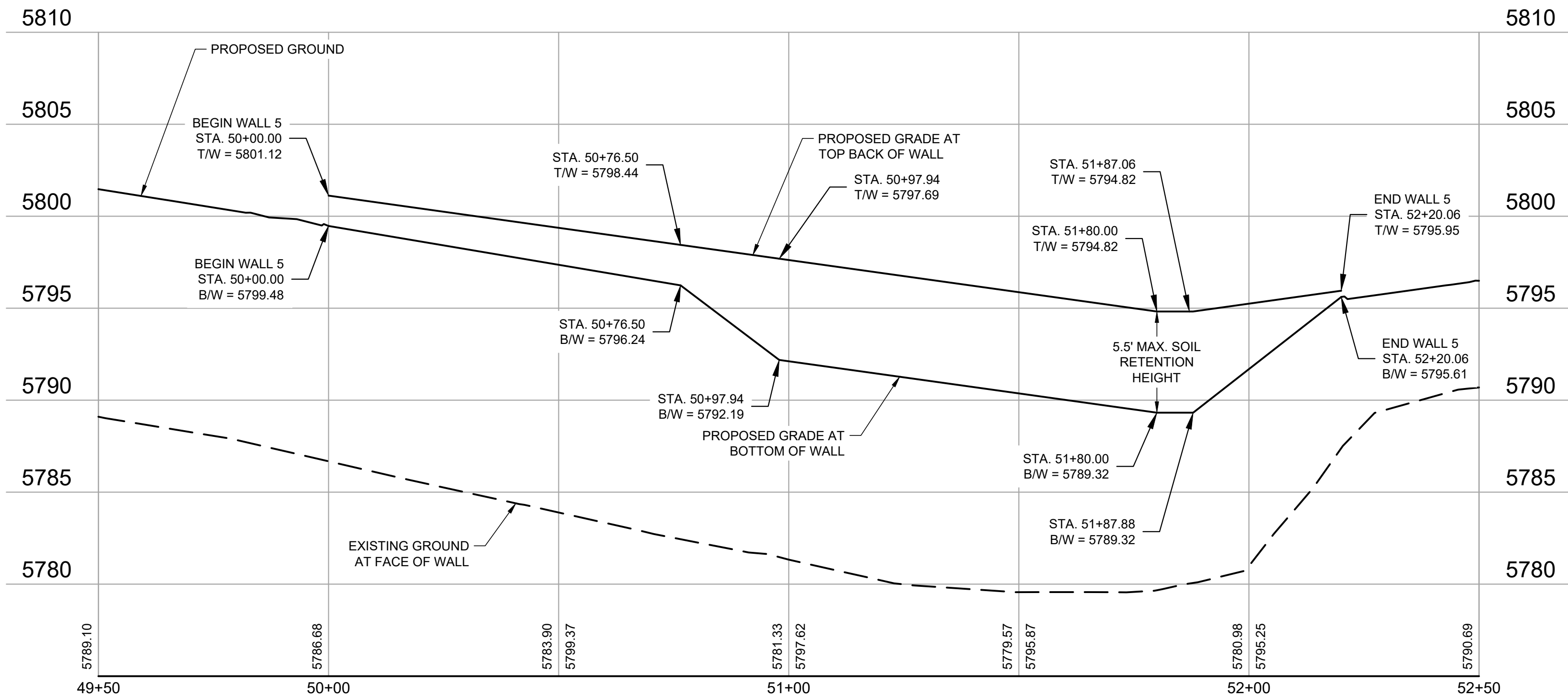
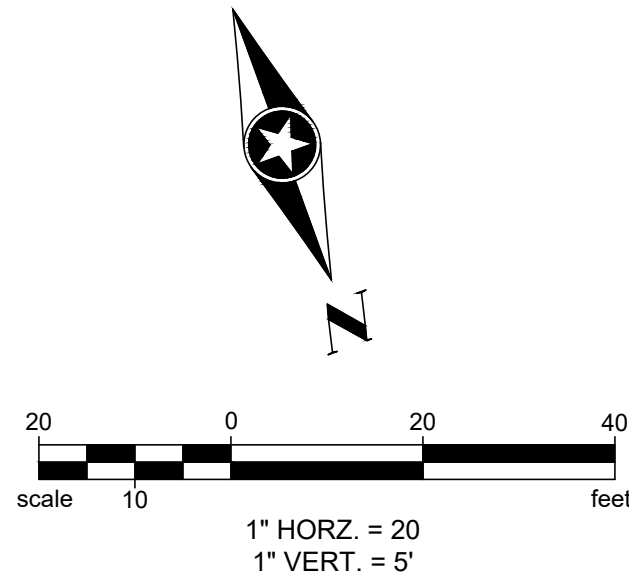
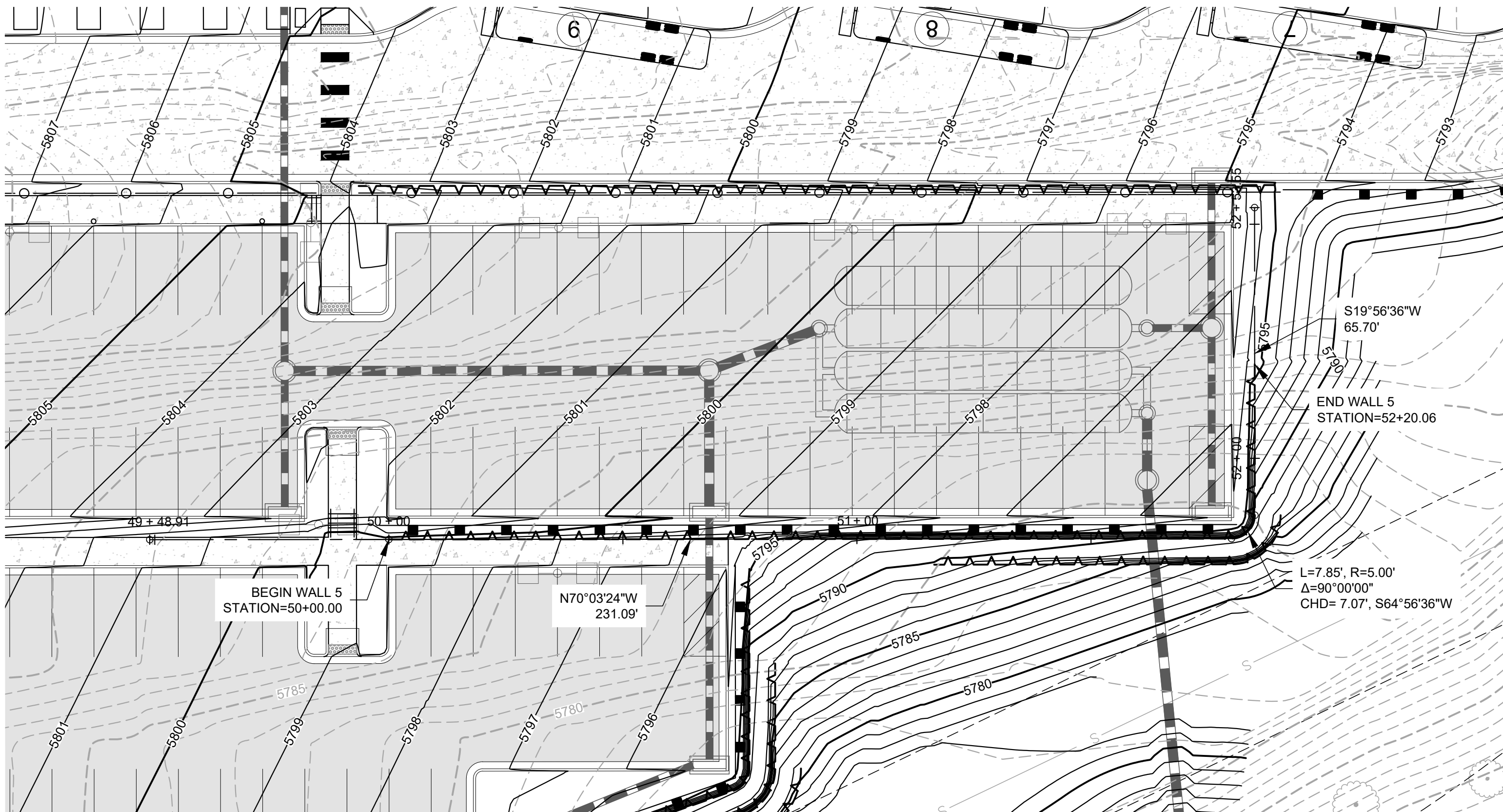
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| Print Date: 9/17/2024 9:33 AM                                                                                                                                                                                                                                                           |                       | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 | FIR Plans     |  | PHASE 6A WALL 4 PLAN AND PROFILE |                        |              |  | Project No./Code |  |
| File Name: PH 6A - Wall Plan and Profile.dwg                                                                                                                                                                                                                                            |                       | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                     | No Revisions: |  |                                  |                        |              |  | TRG M535-014     |  |
| Horiz. Scale: As Noted                      Vert. Scale: As Noted                                                                                                                                                                                                                       |                       | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                     | Revised:      |  | Designer: T. Nuetzel             | Structure Numbers      | 25924        |  |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 | <input type="radio"/> |                       |          |                            |       |                                                                                                                                                                     | Void:         |  | Detailer: B. Risk                |                        | Sheet Number |  |                  |  |
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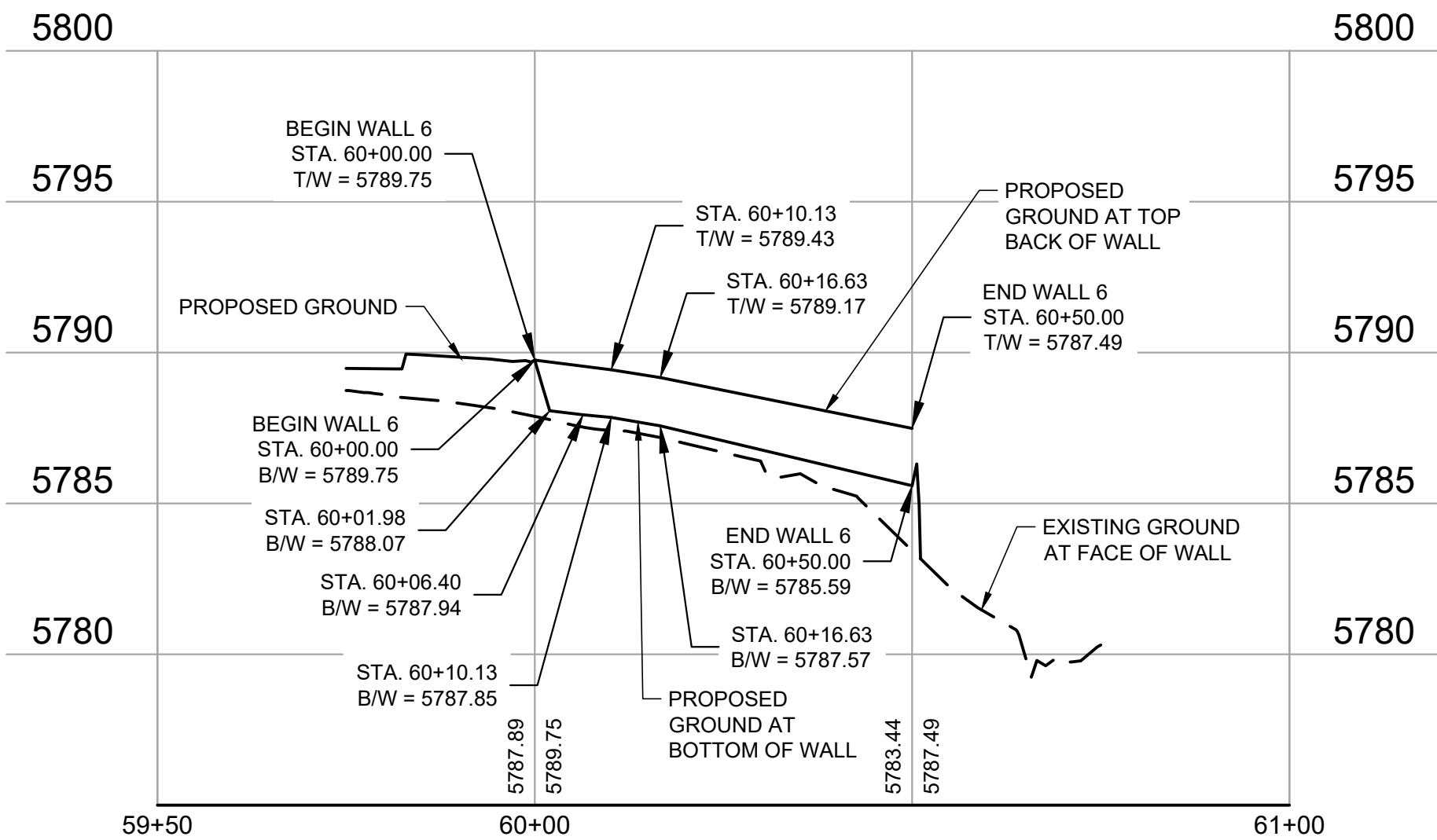
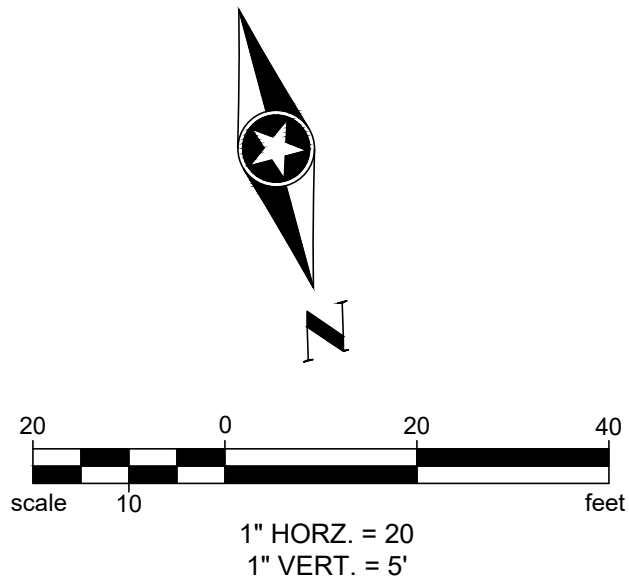
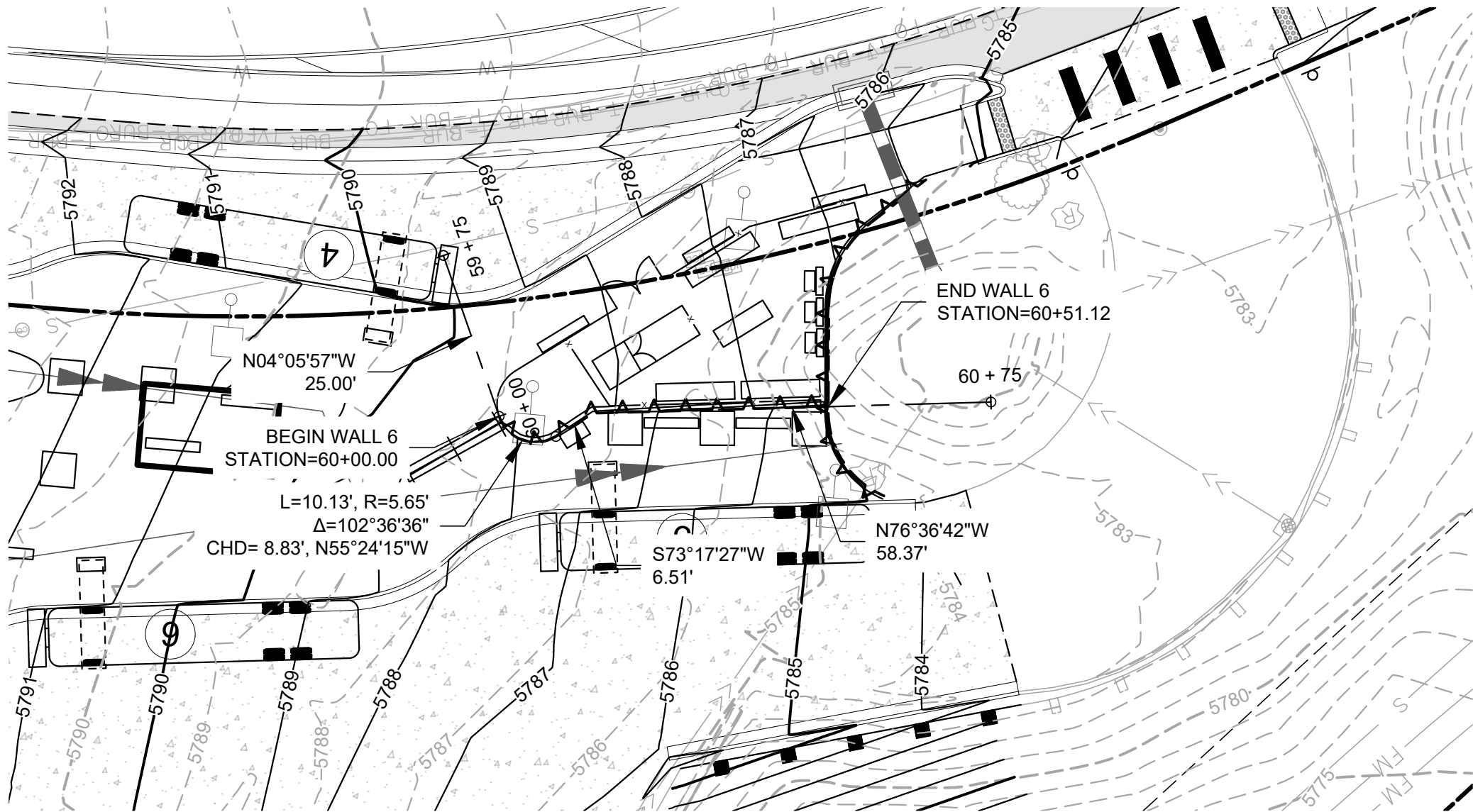




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| Print Date: 9/17/2024 9:34 AM                                                                                                                                                                                                                                                           |  | Sheet Revisions       |      |                       |          | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans                  |                   | PHASE 6A WALL 5 PLAN AND PROFILE |                        |                   |       | Project No./Code |  |
| File Name: PH 6A - Wall Plan and Profile.dwg                                                                                                                                                                                                                                            |  | Rev.                  | Date | Comments              | Init.    |                                                                                                                                                                 |  | No Revisions:              |                   |                                  |                        |                   |       | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                                                  |  | Vert. Scale: As Noted |      | <input type="radio"/> | 09/17/24 |                                                                                                                                                                 |  | 50% CONSTRUCTION DOCUMENTS | TN/BR             | Revised:                         | Designer: T. Nuetzel   | Structure Numbers | 25924 |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |  | <input type="radio"/> |      |                       |          |                                                                                                                                                                 |  | Void:                      | Detailer: B. Risk | Sheet Subset:                    | Subset Sheets: C505 of | Sheet Number      |       |                  |  |

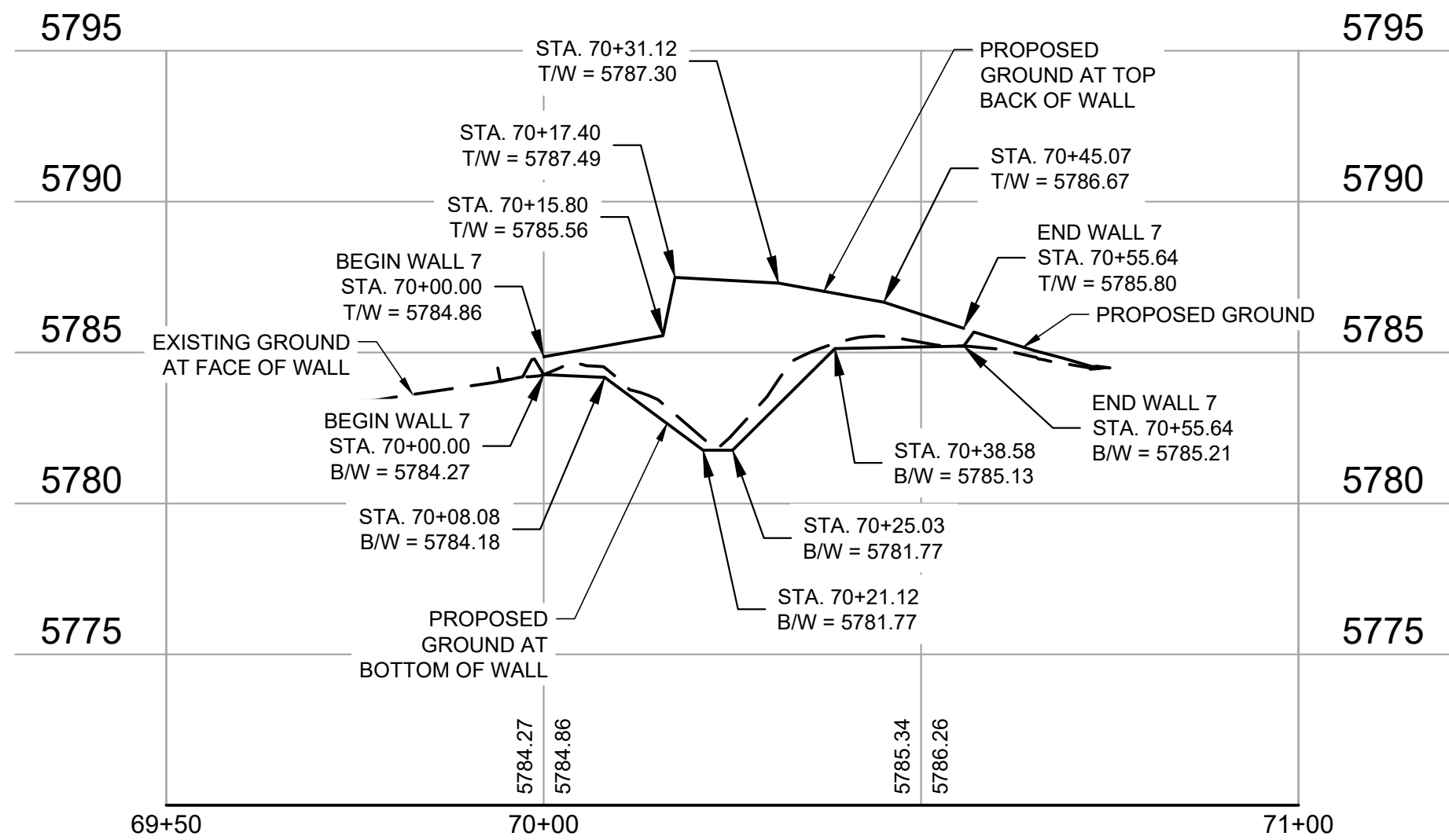
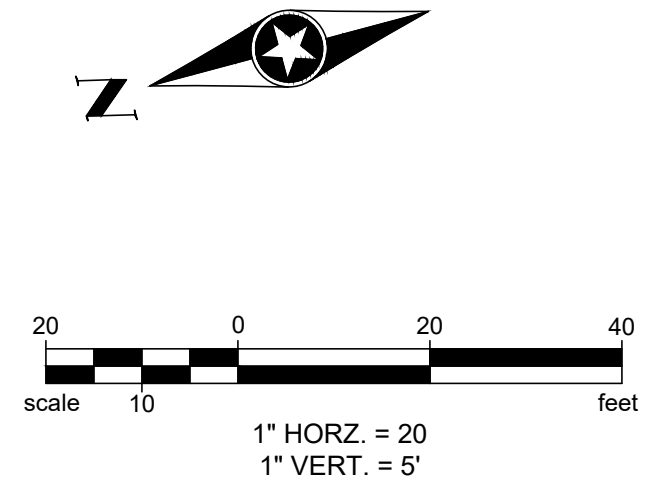
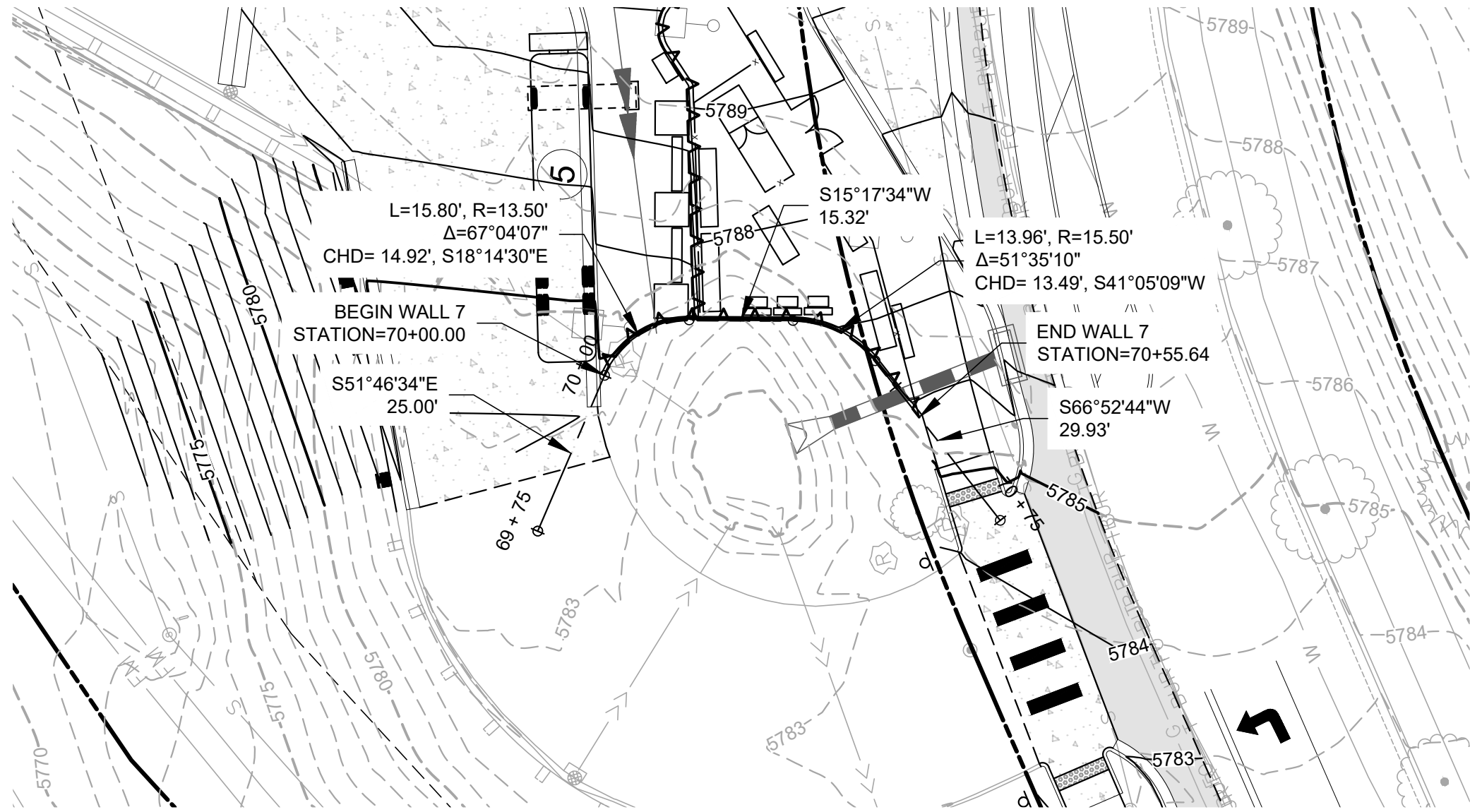




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| File Name: PH 6A - Wall Plan and Profile.dwg                                                                                                                                                                                                                                            |  | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                                  |                   |              |  | TRG M535-014     |  |
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|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |  | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Detailer: B. Risk                |                   | Sheet Number |  |                  |  |
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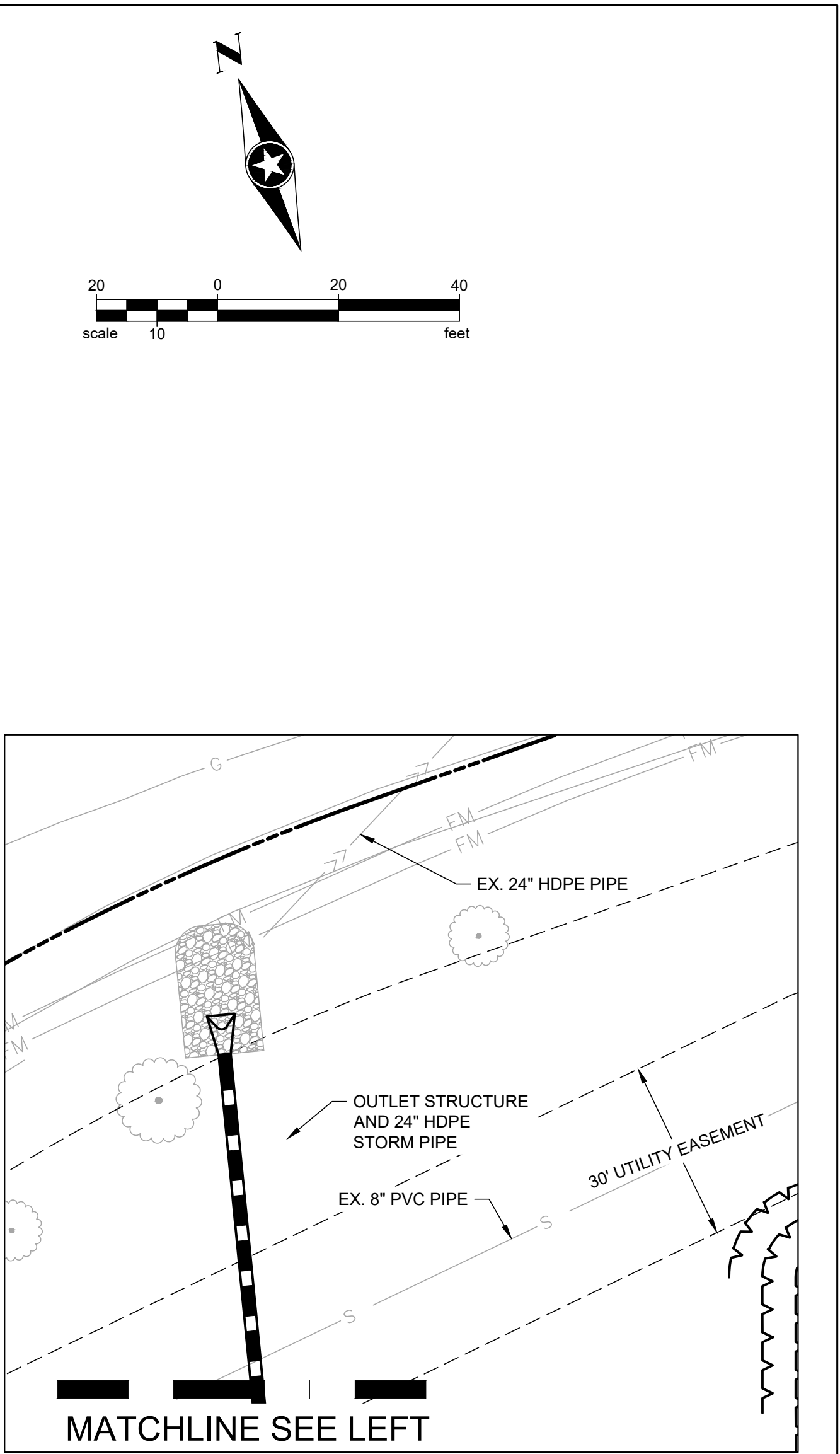
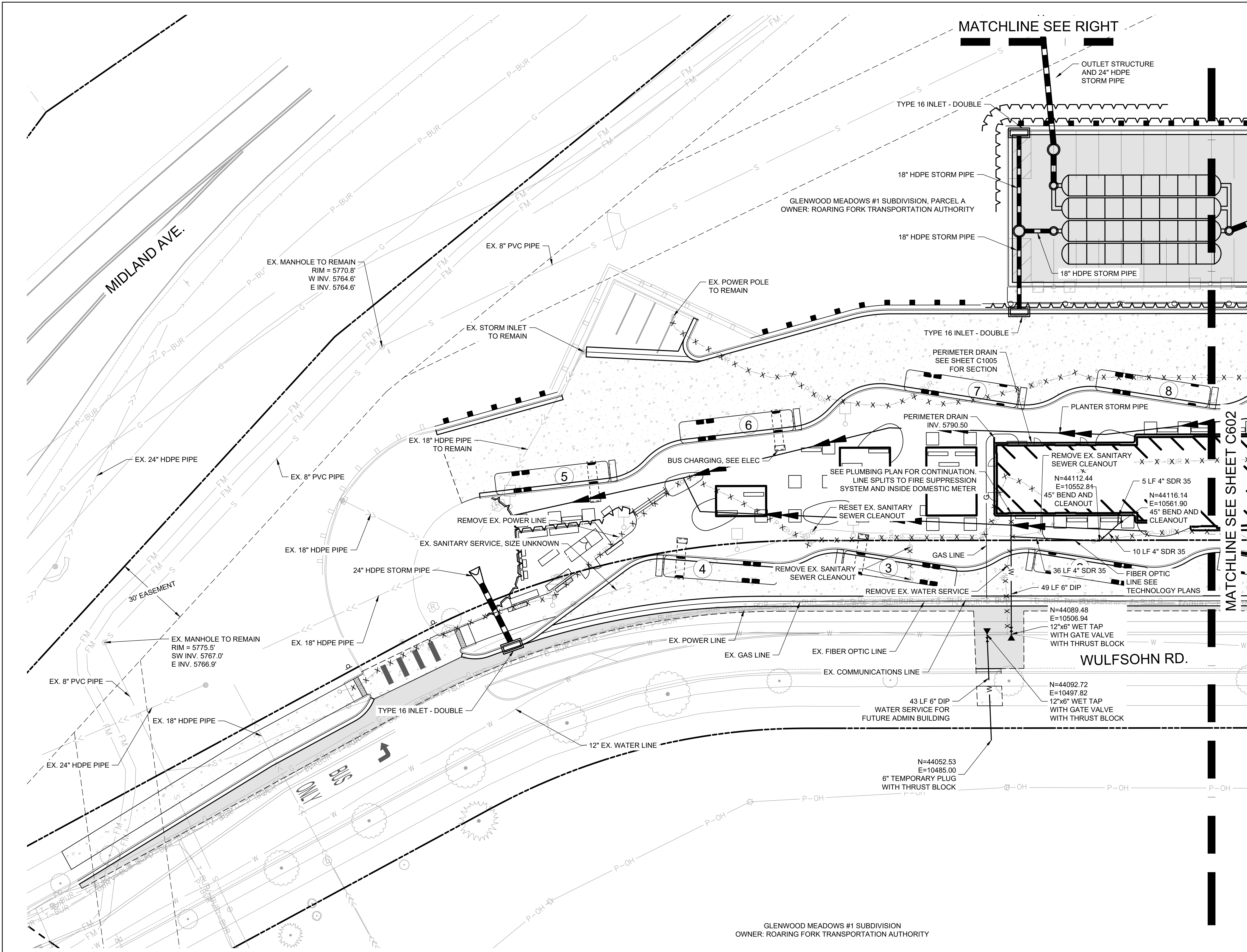


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| File Name: PH 6A - Wall Plan and Profile.dwg                                                                                                                                                                                                                                            |                       | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                                  |                        |              |  | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                       |                       | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Designer: T. Nuetzel             | Structure Numbers      | 25924        |  |                  |  |
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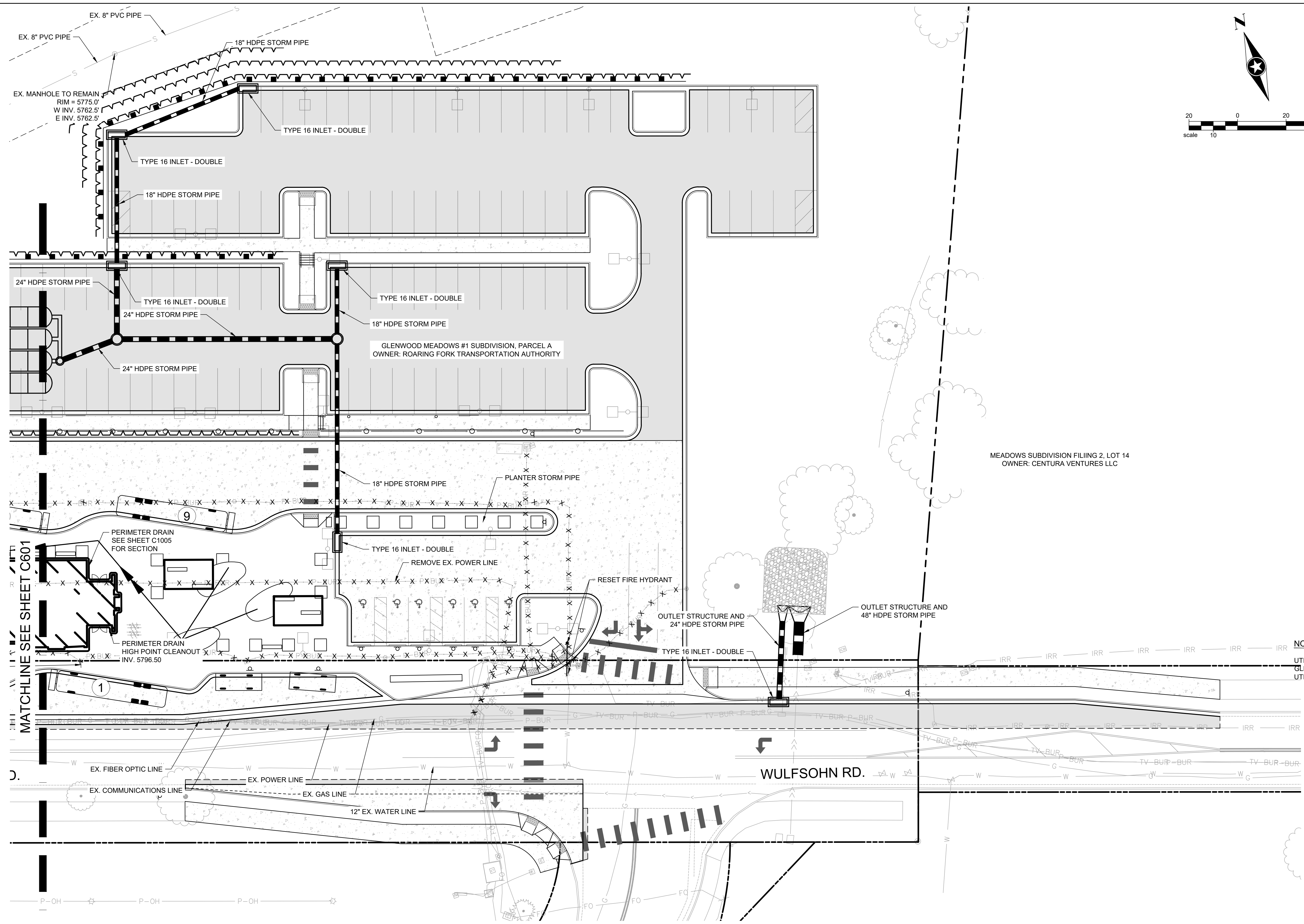
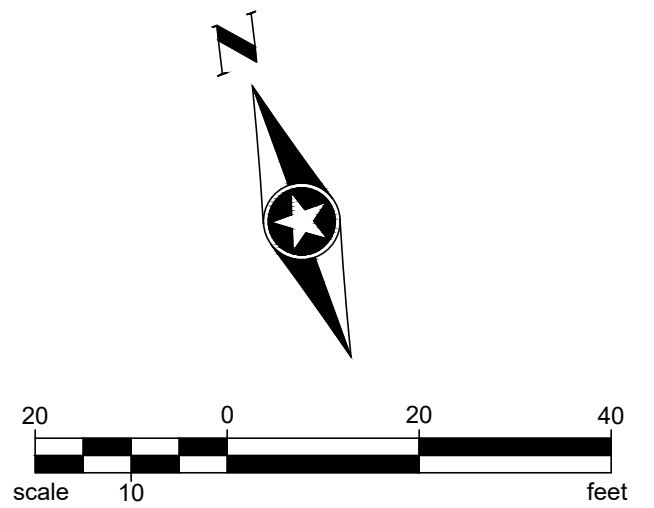
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NOTES:  
UTILITIES SHALL COMPLY WITH THE CITY OF  
GLENWOOD SPRINGS STANDARDS AND RESPECTIVE  
UTILITY PROVIDER STANDARDS.

|                                                                                                                                                                                                                                                                                         |                       |                       |          |                            |       |                                                                                                                                                                 |  |               |  |                       |                        |  |                  |  |
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| File Name: PH 6A - Utility Plan.dwg                                                                                                                                                                                                                                                     |                       | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                       |                        |  | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                                                  | Vert. Scale: As Noted | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Designer: T. Nuetzel  | Structure Numbers      |  | 25924            |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                       | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Detailer: B. Risk     |                        |  | Sheet Number     |  |
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UTILITIES SHALL COMPLY WITH THE CITY OF  
GLENWOOD SPRINGS STANDARDS AND RESPECTIVE  
UTILITY PROVIDER STANDARDS.

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Horiz. Scale: As Noted

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 Short Elliott Hendrickson Inc.  
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Denver, CO 80222-7900

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Fax (720) 540-6801

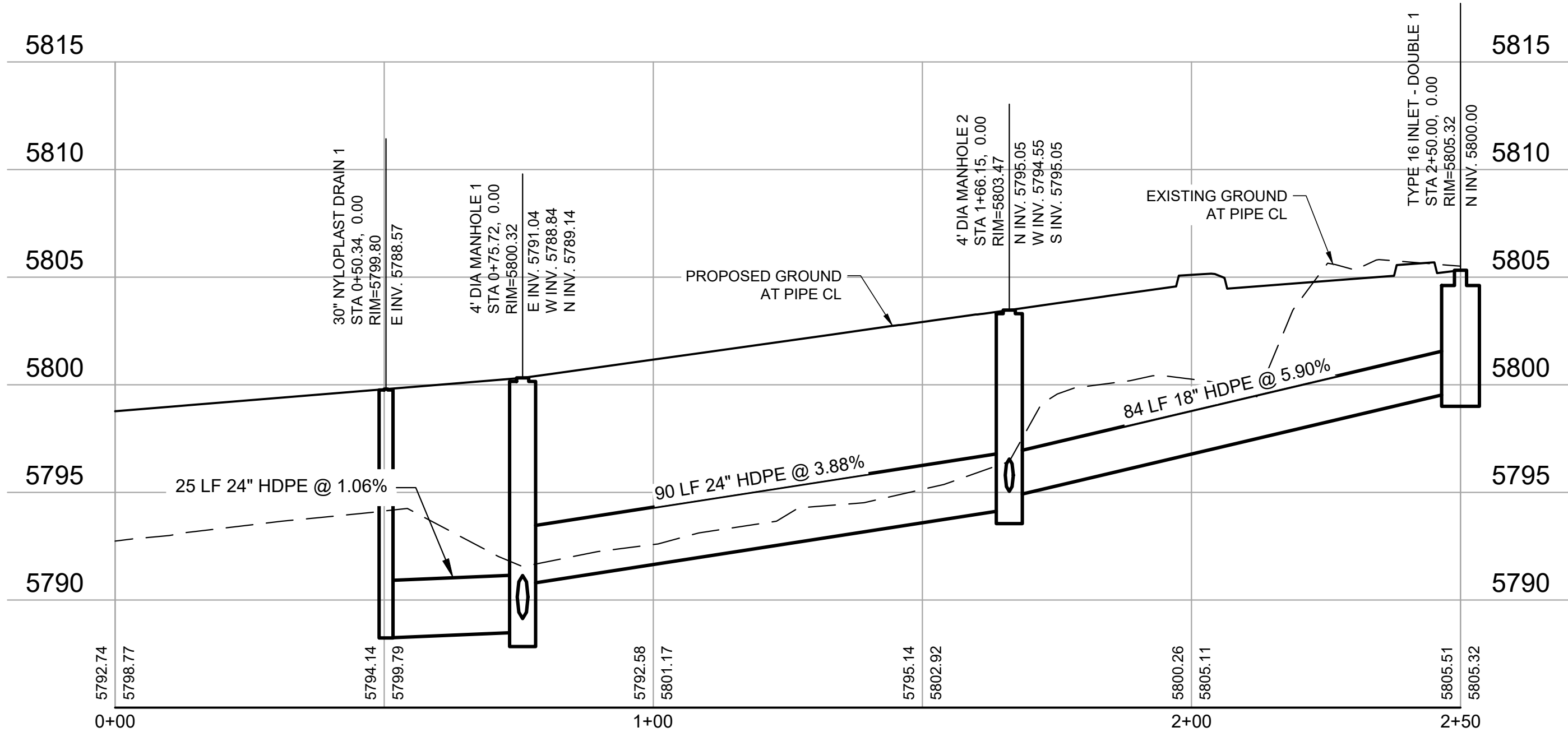
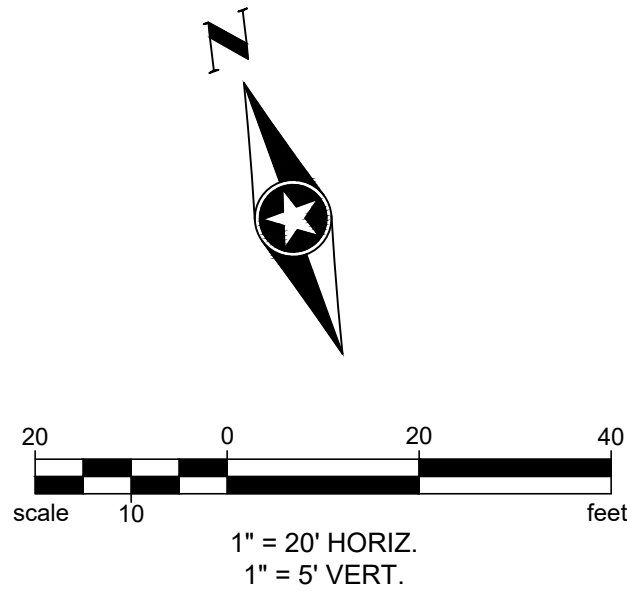
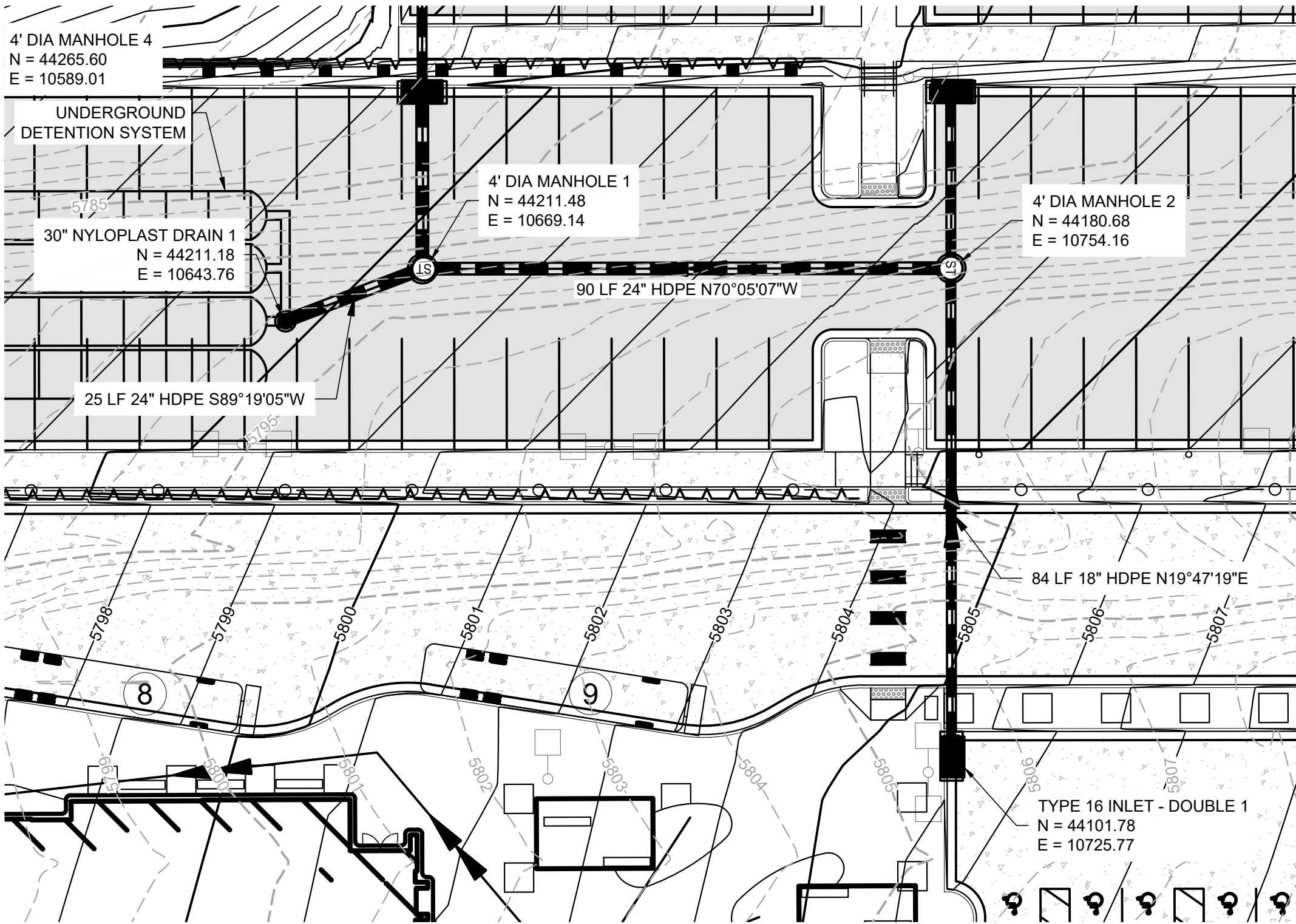
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ROARING FORK TRANSPORTATION AUTHORITY  
**WEST GLENWOOD TRANSIT CENTER  
AND ADMINISTRATION OFFICES**  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     |  | PHASE 6A UTILITY PLAN |                        |  | Project No./Code |
|---------------|--|-----------------------|------------------------|--|------------------|
| No Revisions: |  |                       |                        |  | TRG M535-014     |
| Revised:      |  | Designer: T. Nuetzel  | Structure Numbers      |  | 25924            |
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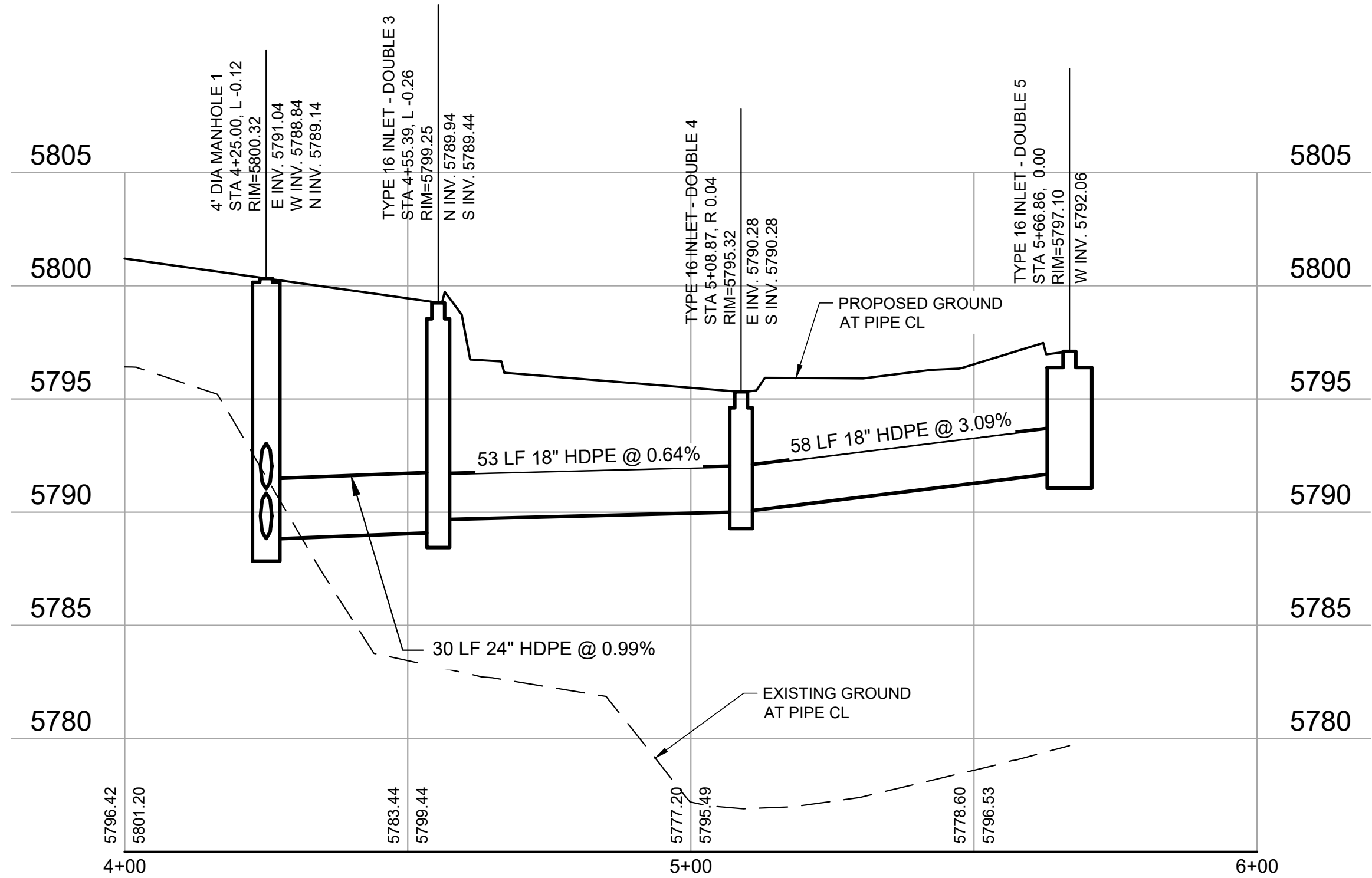
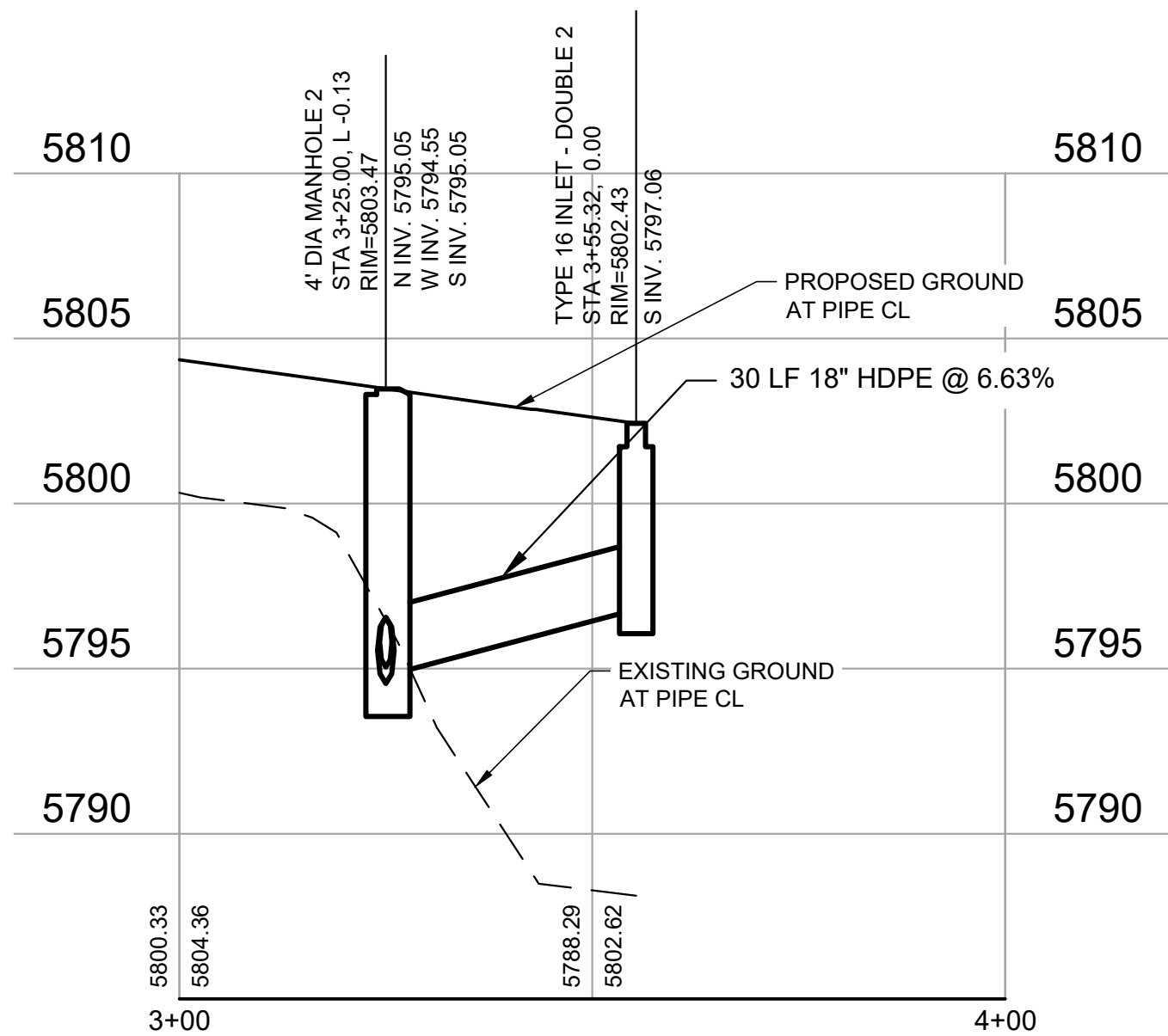
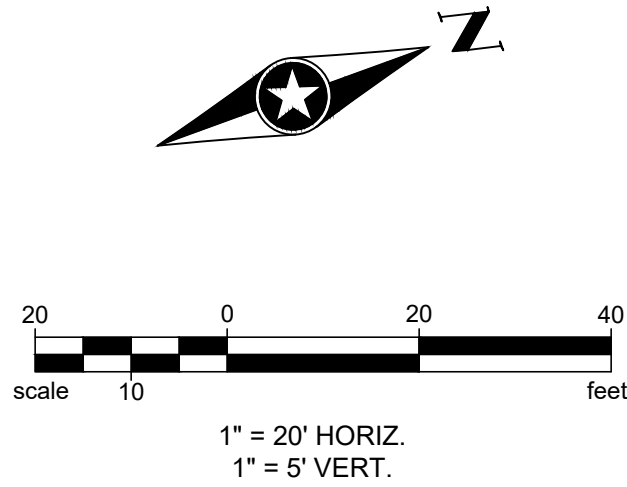
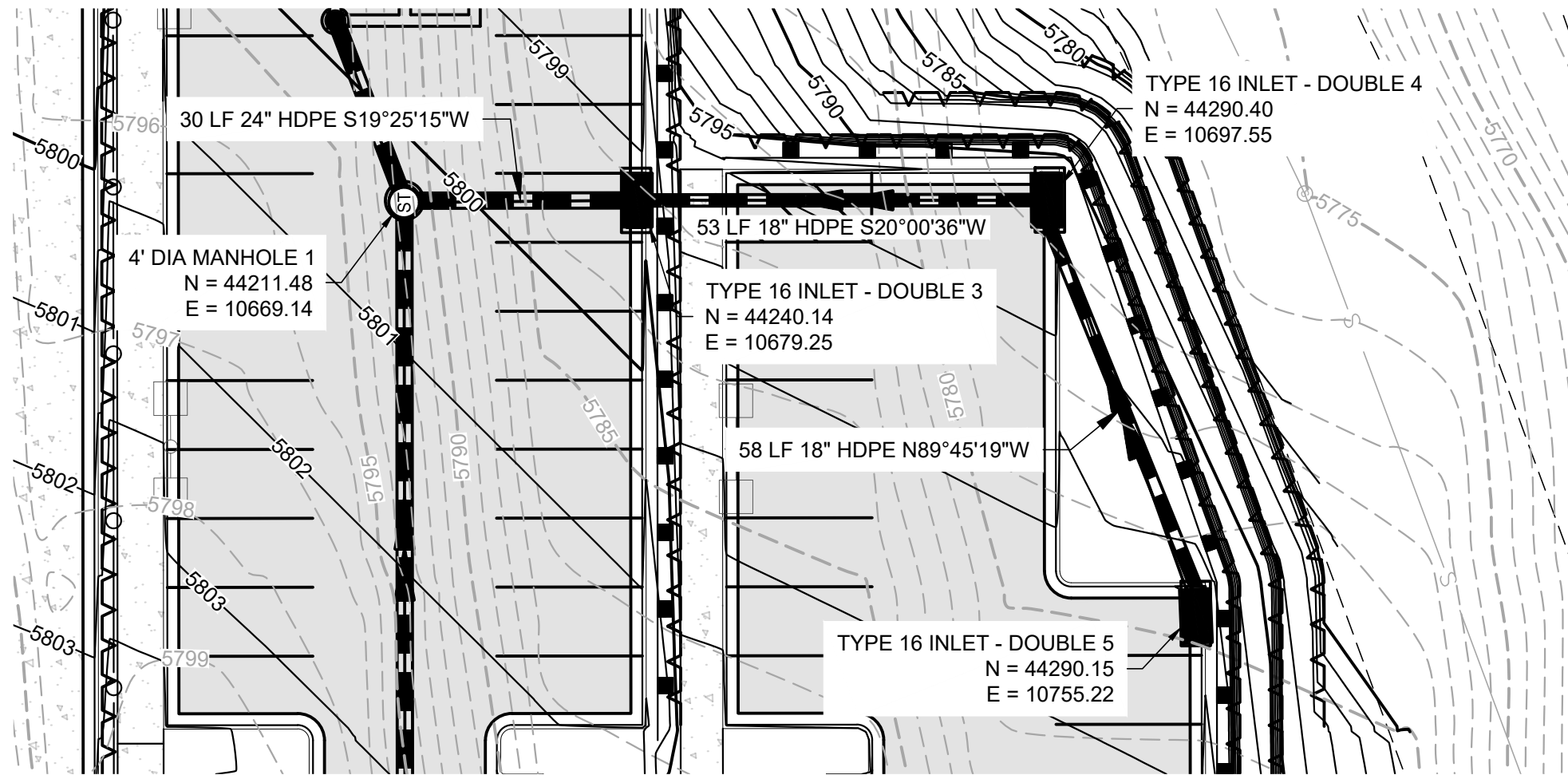
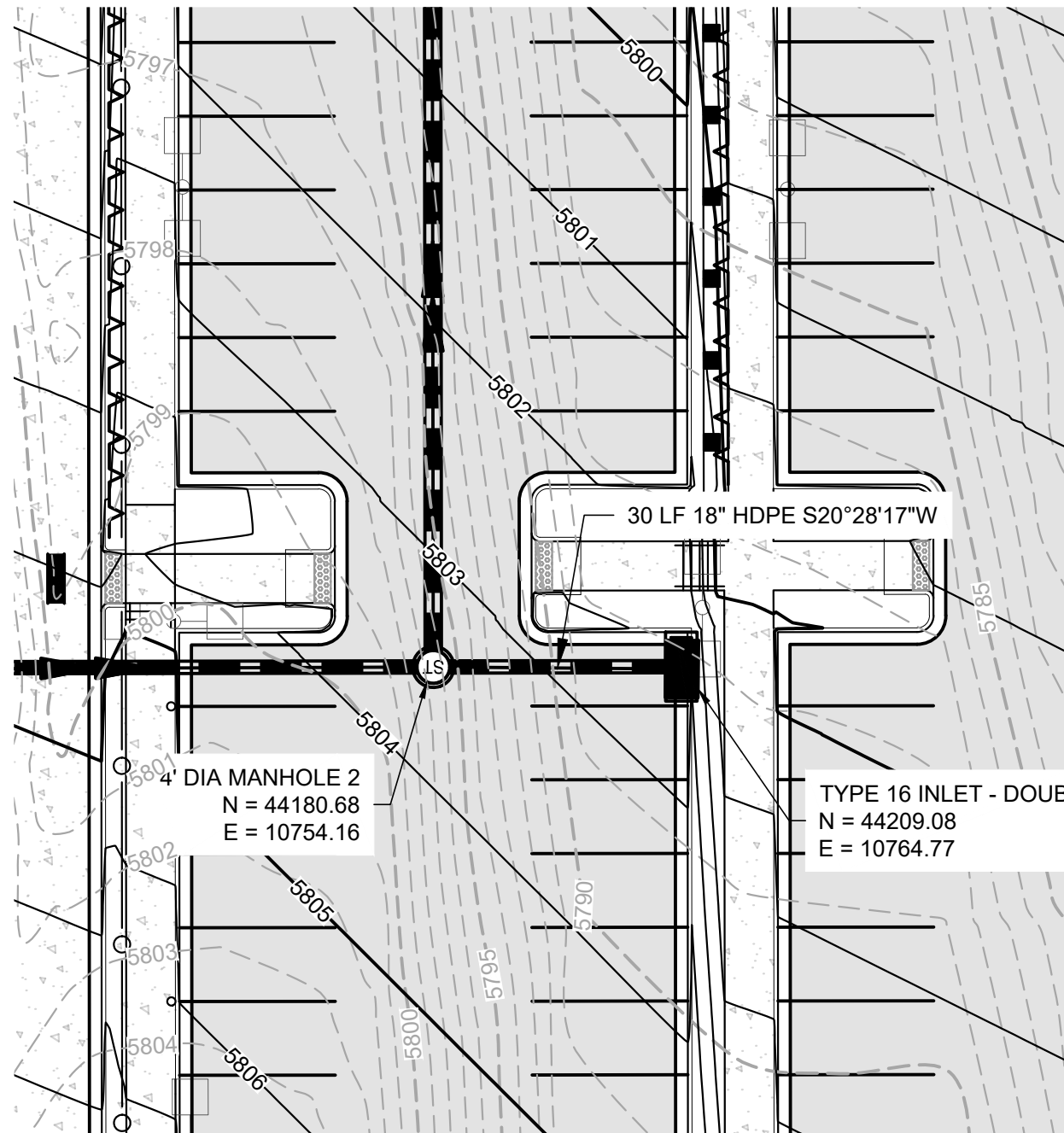
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| Print Date: 9/17/2024 9:24 AM                                                                                                                                                                                                                                                                                                  |  | Sheet Revisions |                 |                            |                  | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A STORM PLAN AND PROFILE |  |                      |  | Project No./Code  |              |  |
| File Name: PH 6A - Storm Plan and Profile.dwg                                                                                                                                                                                                                                                                                  |  |                 |                 |                            |                  |                                                                                                                                                                     |  |               |  |                                 |  |                      |  |                   |              |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                                              |  | <div>Rev.</div> | <div>Date</div> | <div>Comments</div>        | <div>Init.</div> |                                                                                                                                                                     |  | No Revisions: |  | Revised:                        |  | Designer: T. Nuetzel |  | Structure Numbers | TRG M535-014 |  |
| <div><div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>     | 09/17/24        | 50% CONSTRUCTION DOCUMENTS | TN/BR            |                                                                                                                                                                     |  |               |  |                                 |  | Detailer: B. Risk    |  |                   | 25924        |  |
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| Print Date:                                                                                                                                                                                                                                                                | 9/17/2024 9:24 AM                  |
| File Name:                                                                                                                                                                                                                                                                 | PH 6A - Storm Plan and Profile.dwg |
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| <div><div><div></div><div>SEH</div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |                                    |

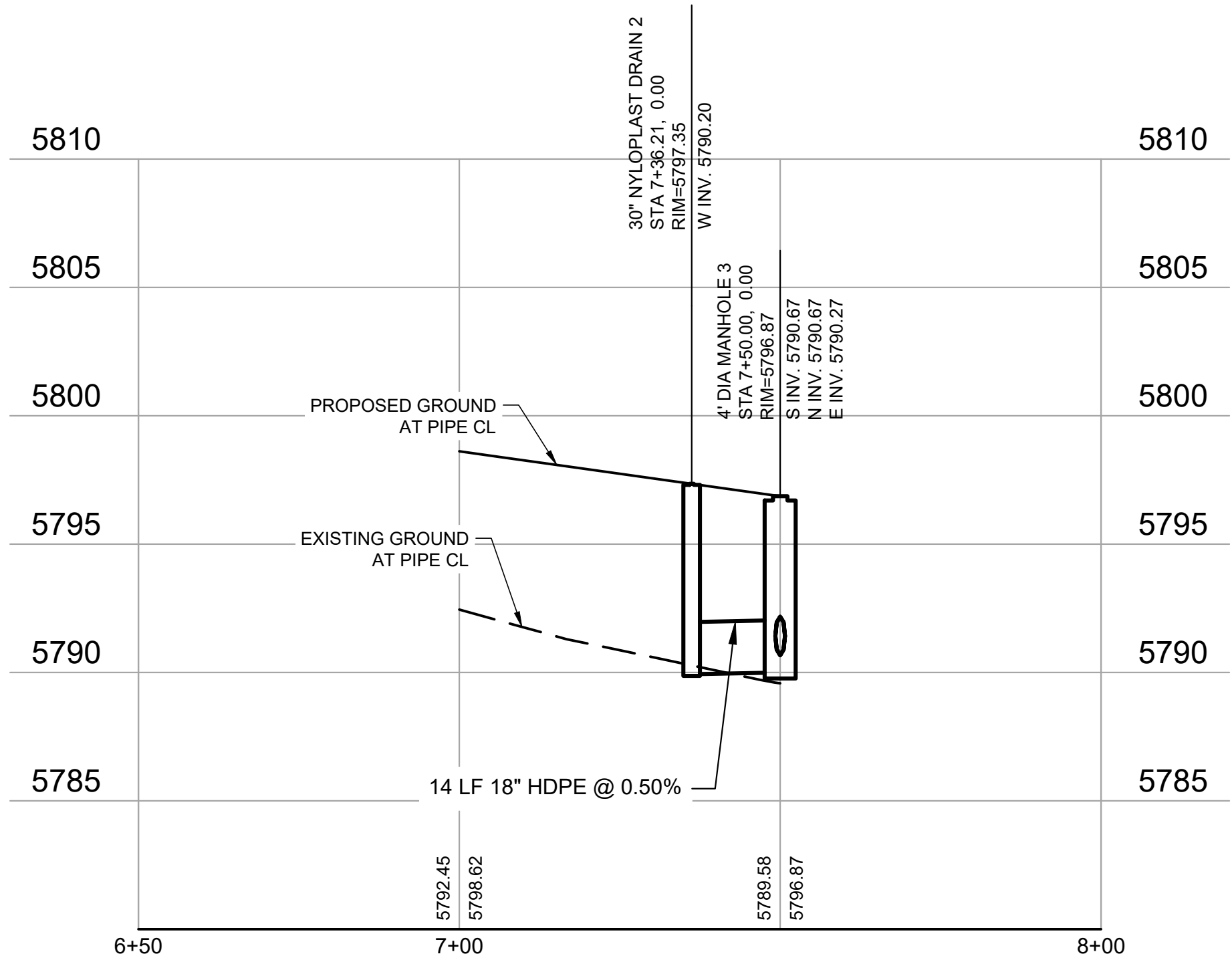
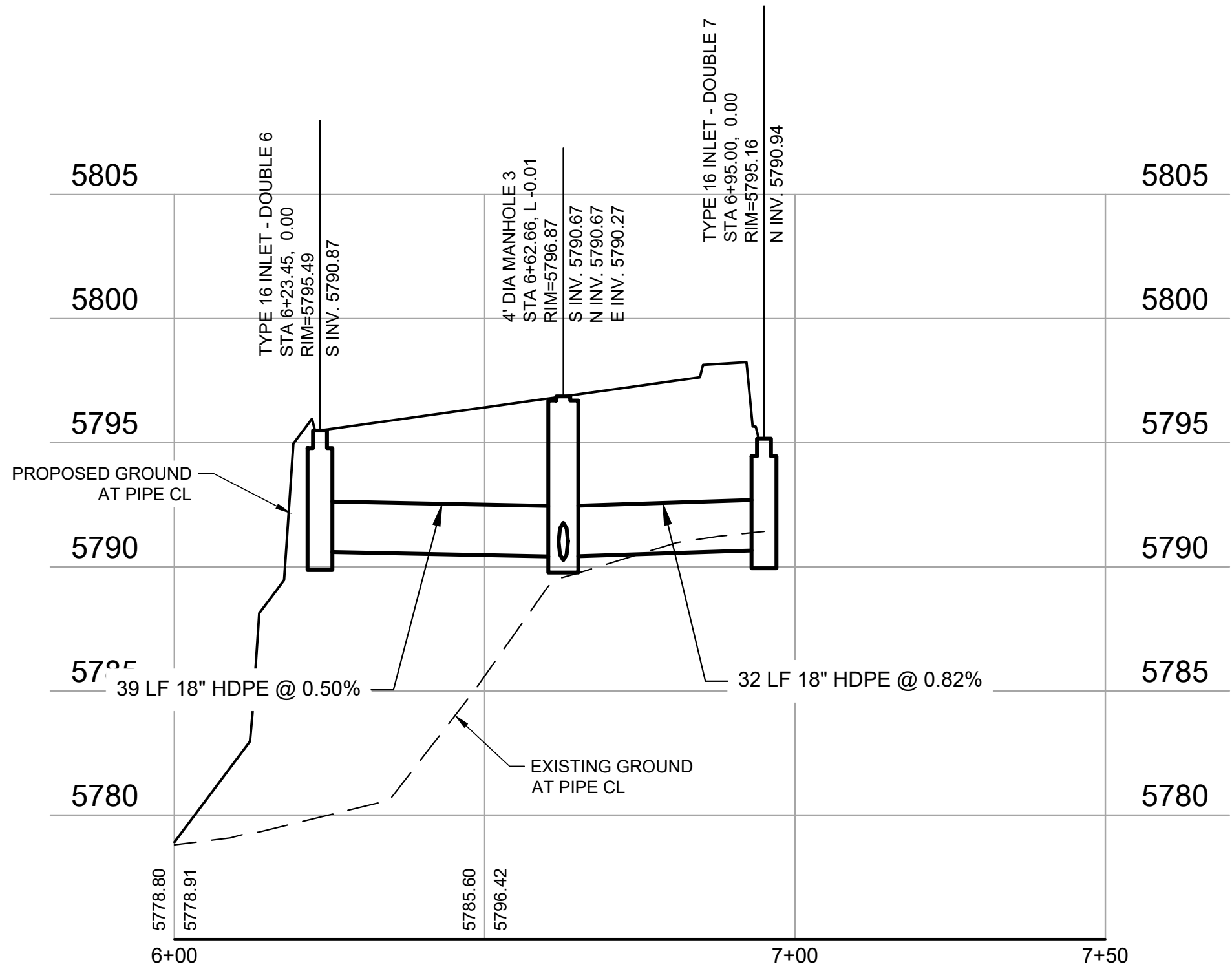
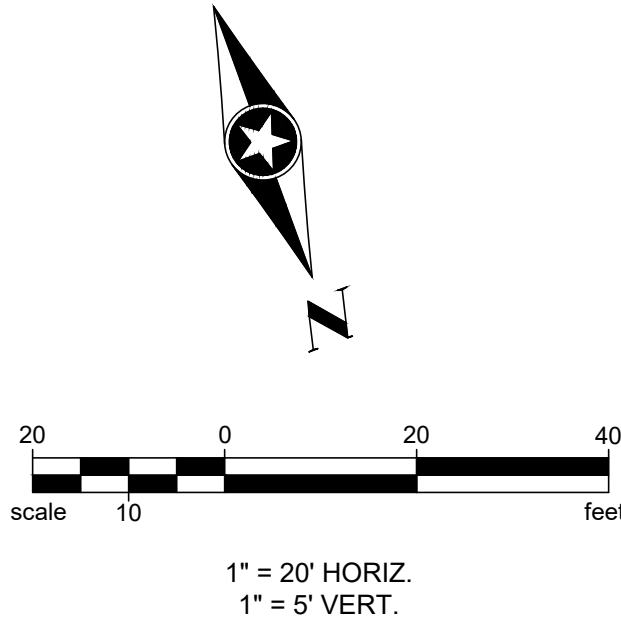
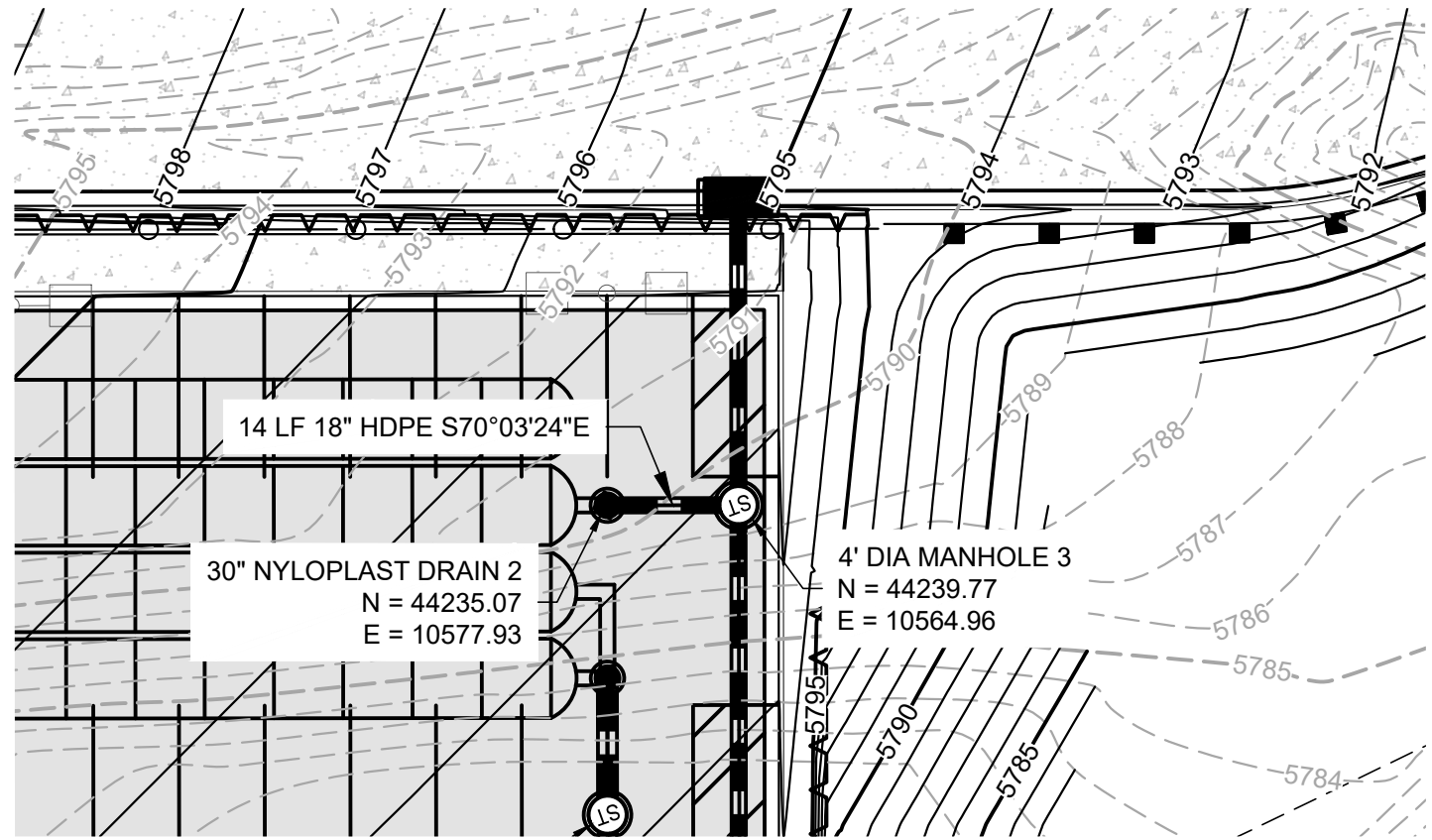
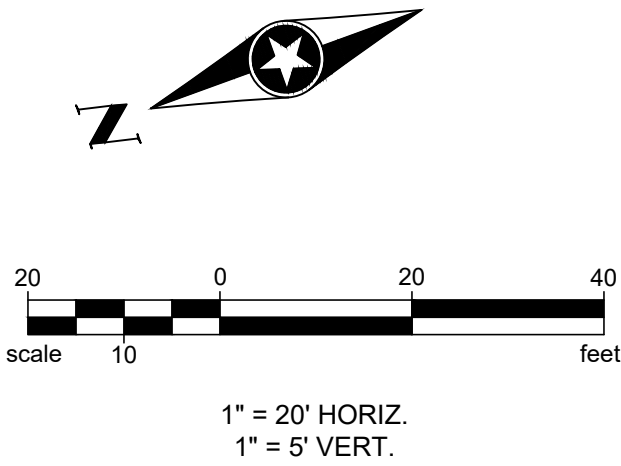
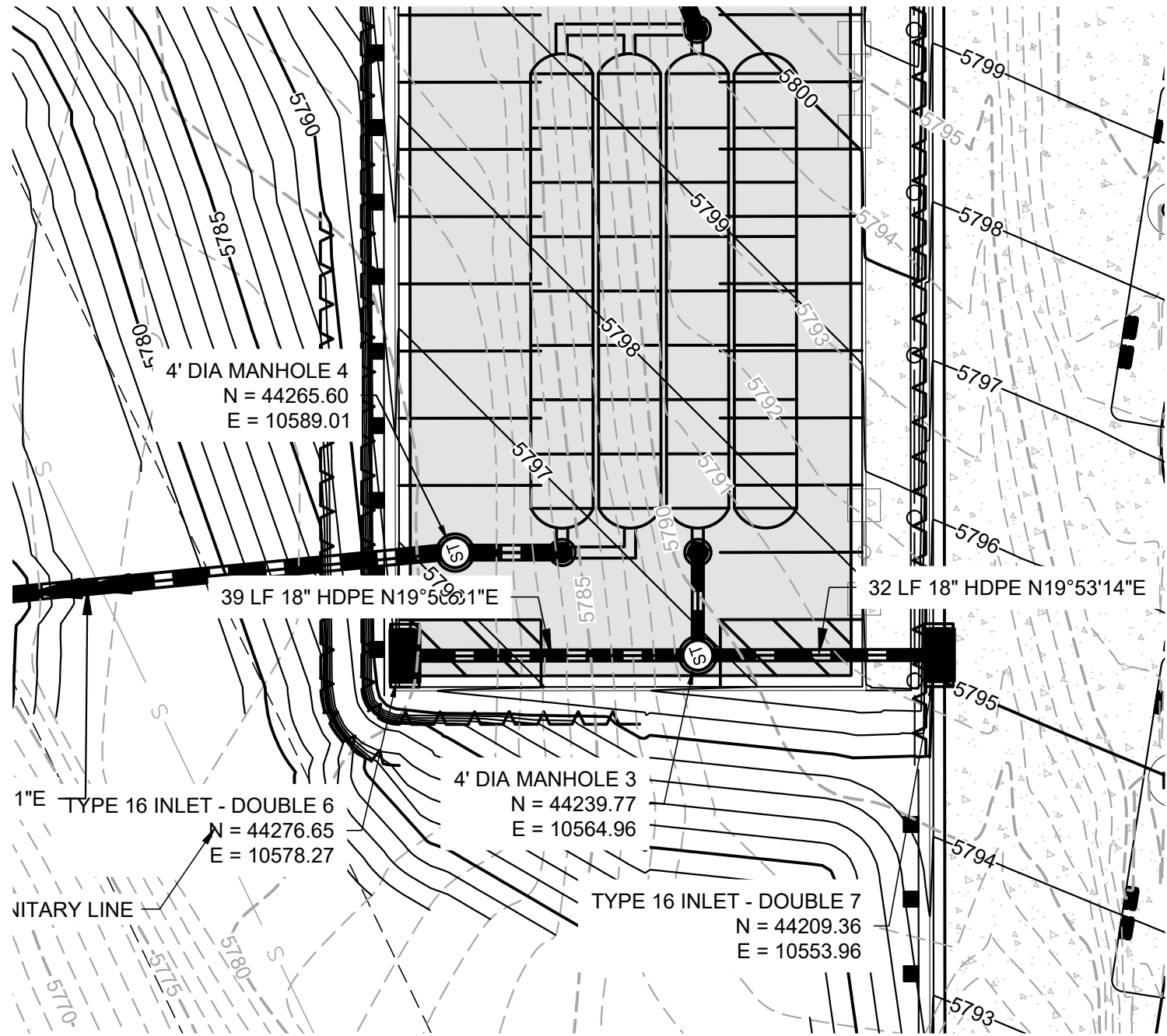
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ROARING FORK TRANSPORTATION AUTHORITY  
**WEST GLENWOOD TRANSIT CENTER  
AND ADMINISTRATION OFFICES**  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     |  | PHASE 6A STORM PLAN AND PROFILE |                        |  | Project No./Code |
|---------------|--|---------------------------------|------------------------|--|------------------|
| No Revisions: |  |                                 |                        |  | TRG M535-014     |
| Revised:      |  | Designer: T. Nuetzel            | Structure Numbers      |  | 25924            |
| Void:         |  | Detailer: B. Risk               |                        |  |                  |
|               |  | Sheet Subset:                   | Subset Sheets: C702 of |  | Sheet Number     |

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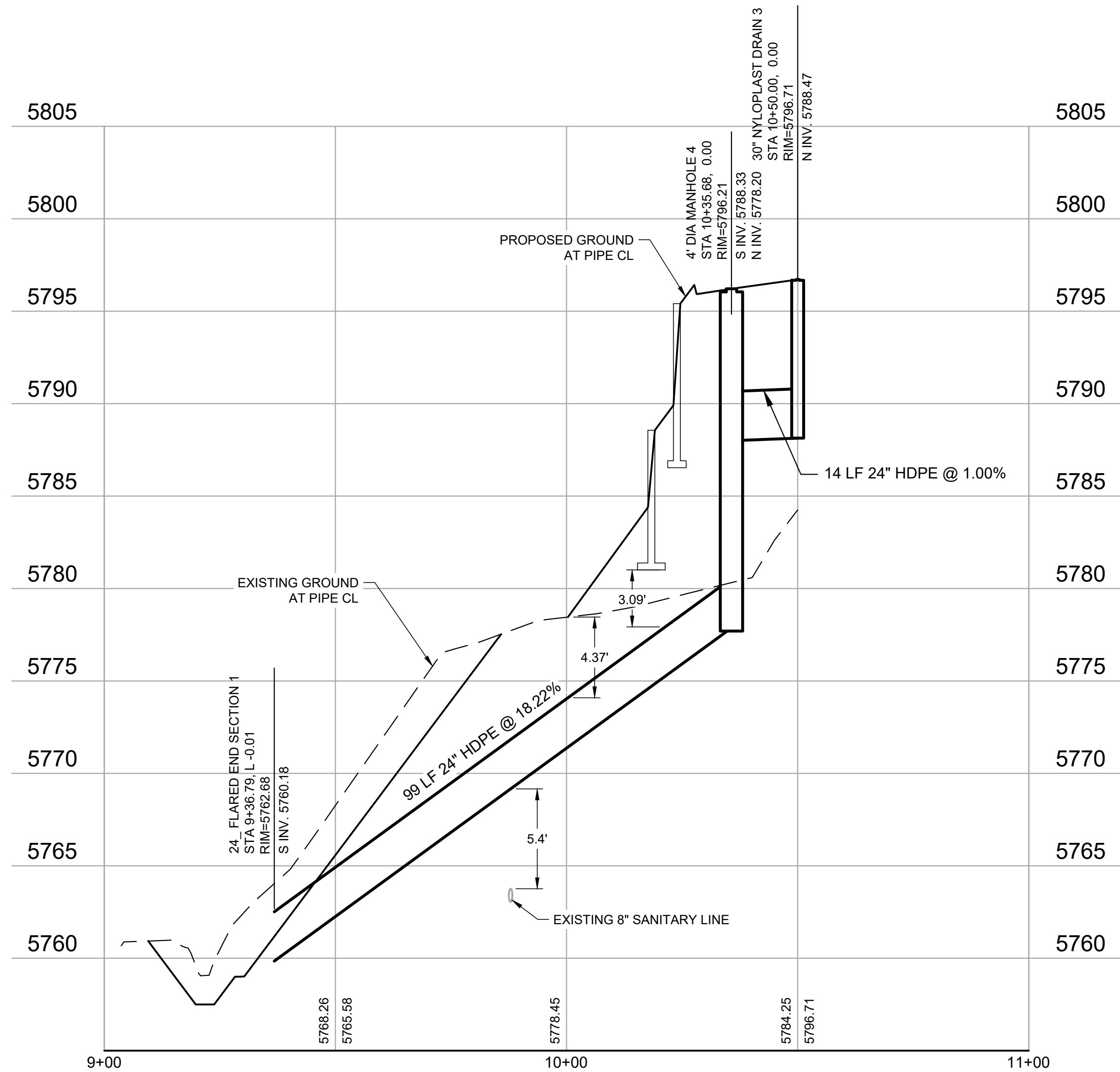
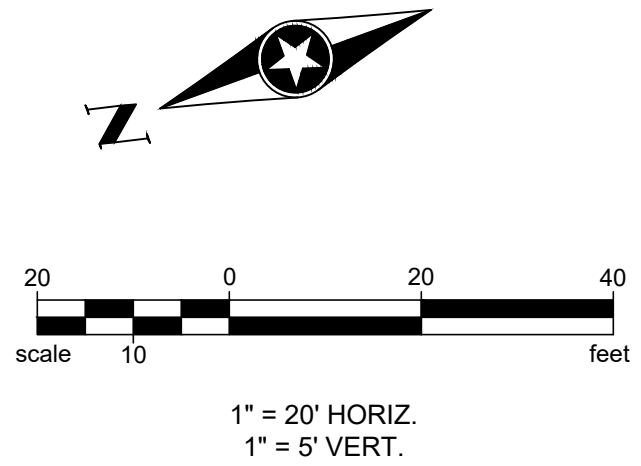
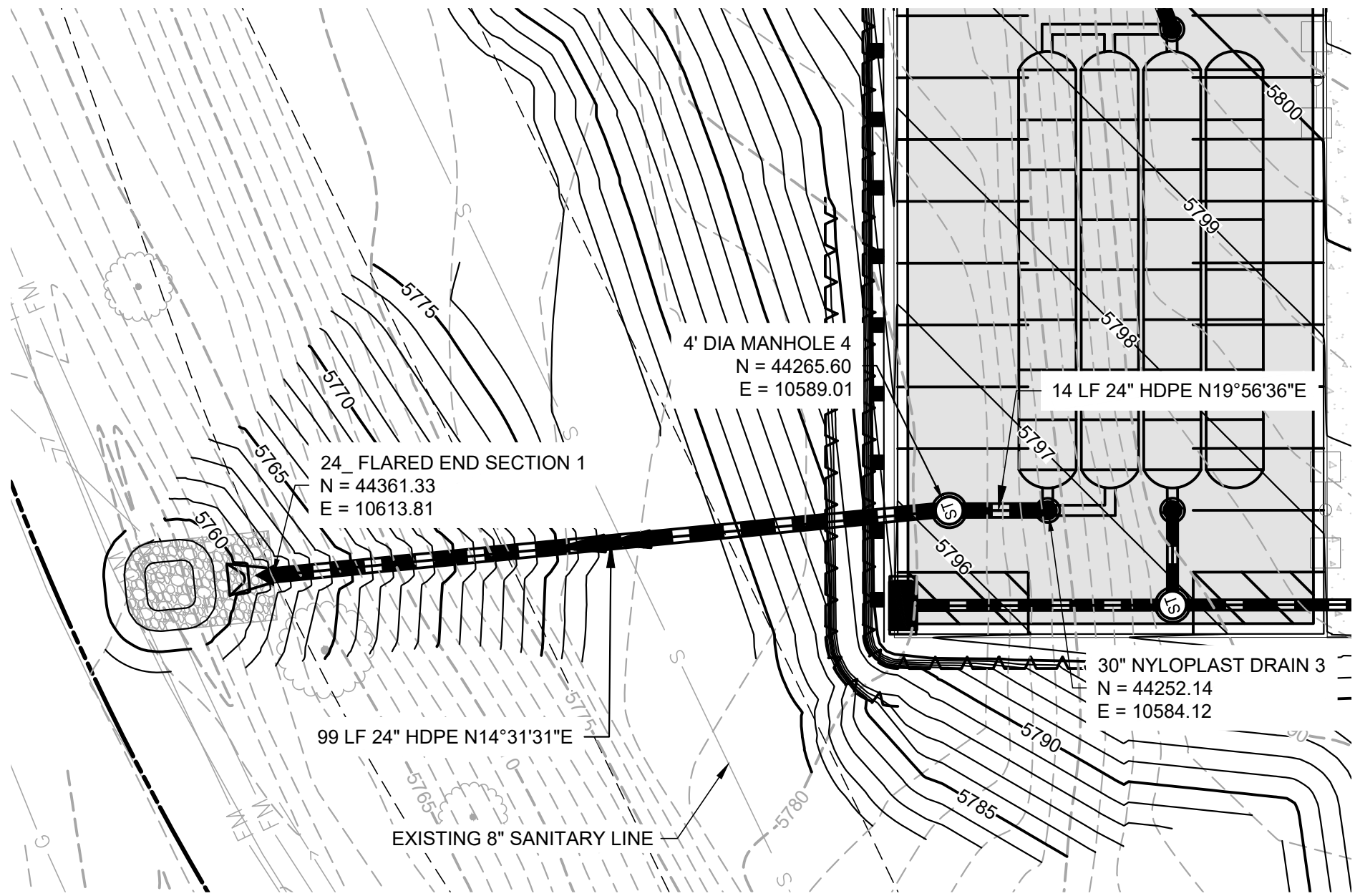


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| Print Date: 9/17/2024 9:24 AM                                                                                                                                                                                           |                       | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |                      | PHASE 6A STORM PLAN AND PROFILE |              |  | Project No./Code |  |
| File Name: PH 6A - Storm Plan and Profile.dwg                                                                                                                                                                           |                       | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |                      |                                 | TRG M535-014 |  |                  |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                  | Vert. Scale: As Noted | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      | Designer: T. Nuetzel | Structure Numbers               | 25924        |  |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900 |                       | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  | Void:         | Detailer: B. Risk    |                                 |              |  | Sheet Number     |  |
| Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801                                                                                                                                                            |                       | <input type="radio"/> |          |                            |       |                                                                                                                                                                 |  |               | Sheet Subset:        | Subset Sheets: C703 of          |              |  |                  |  |

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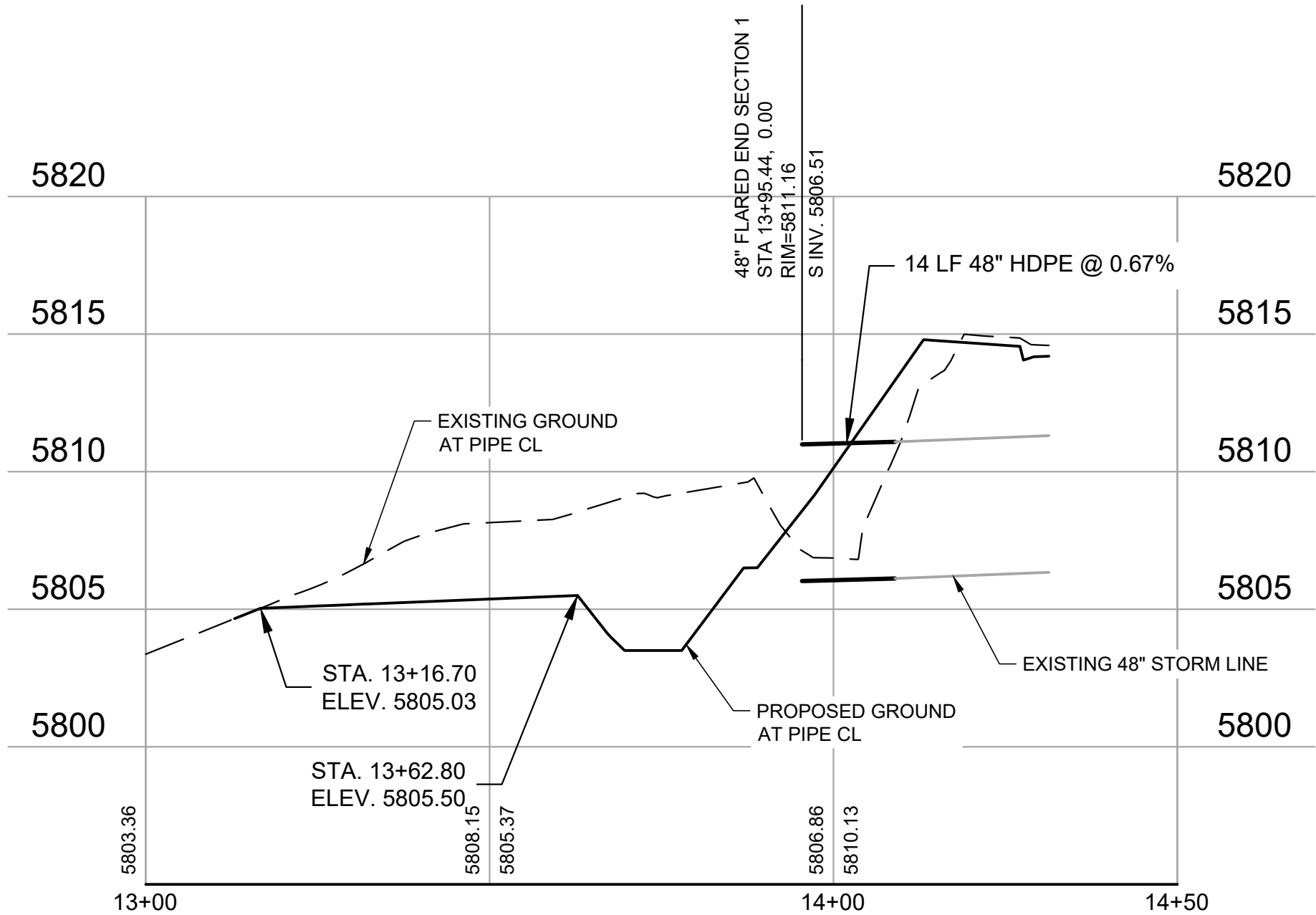
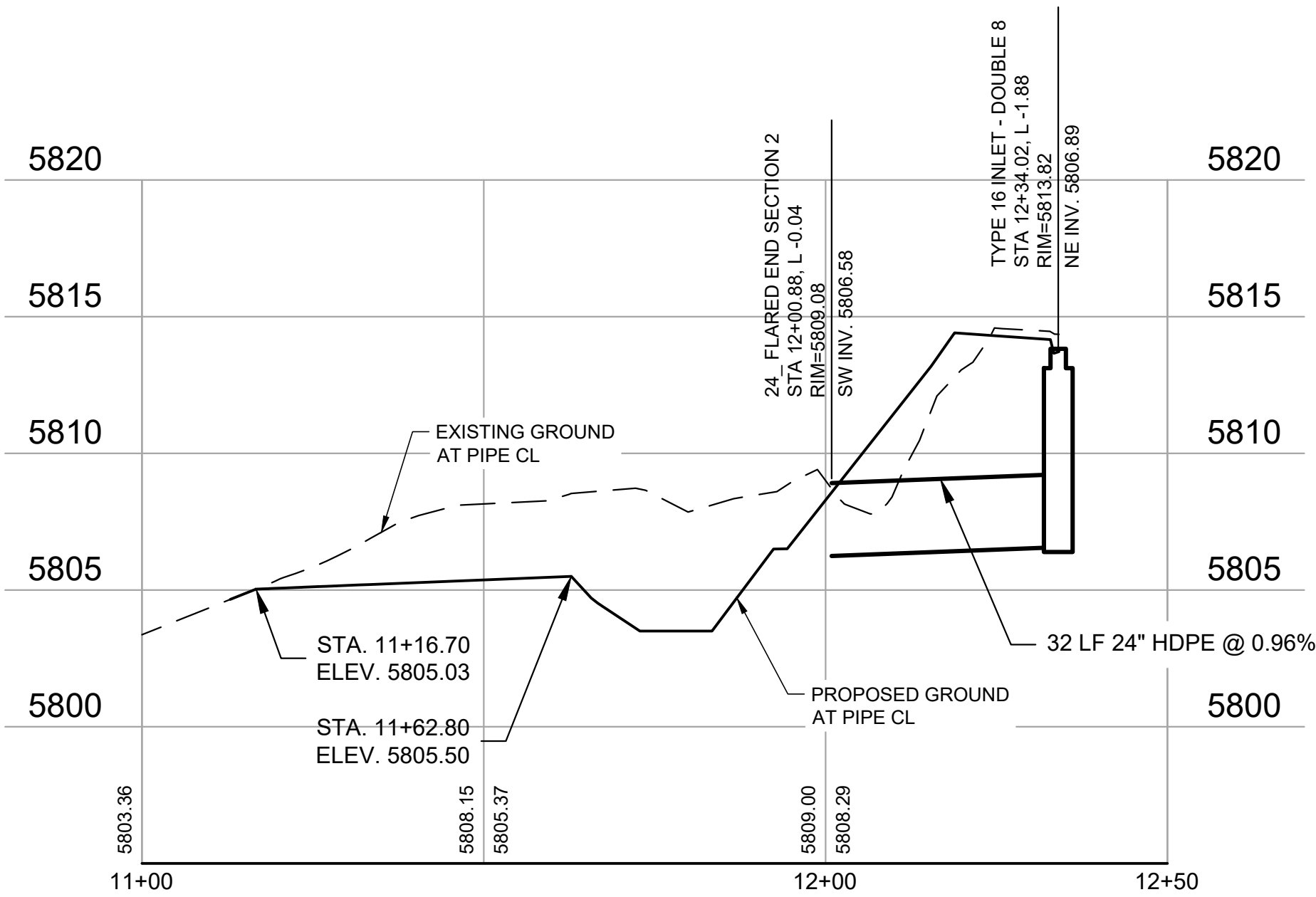
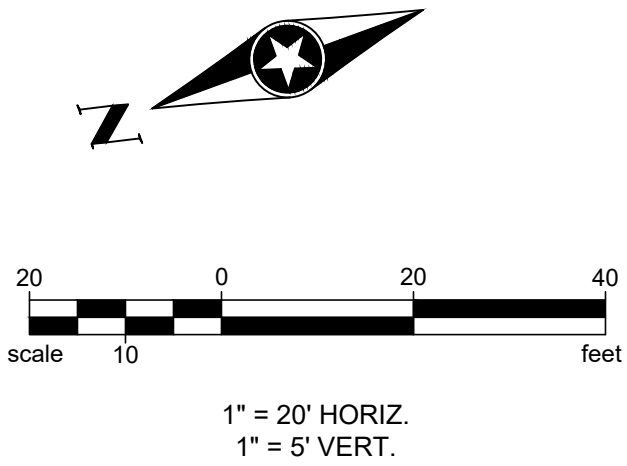
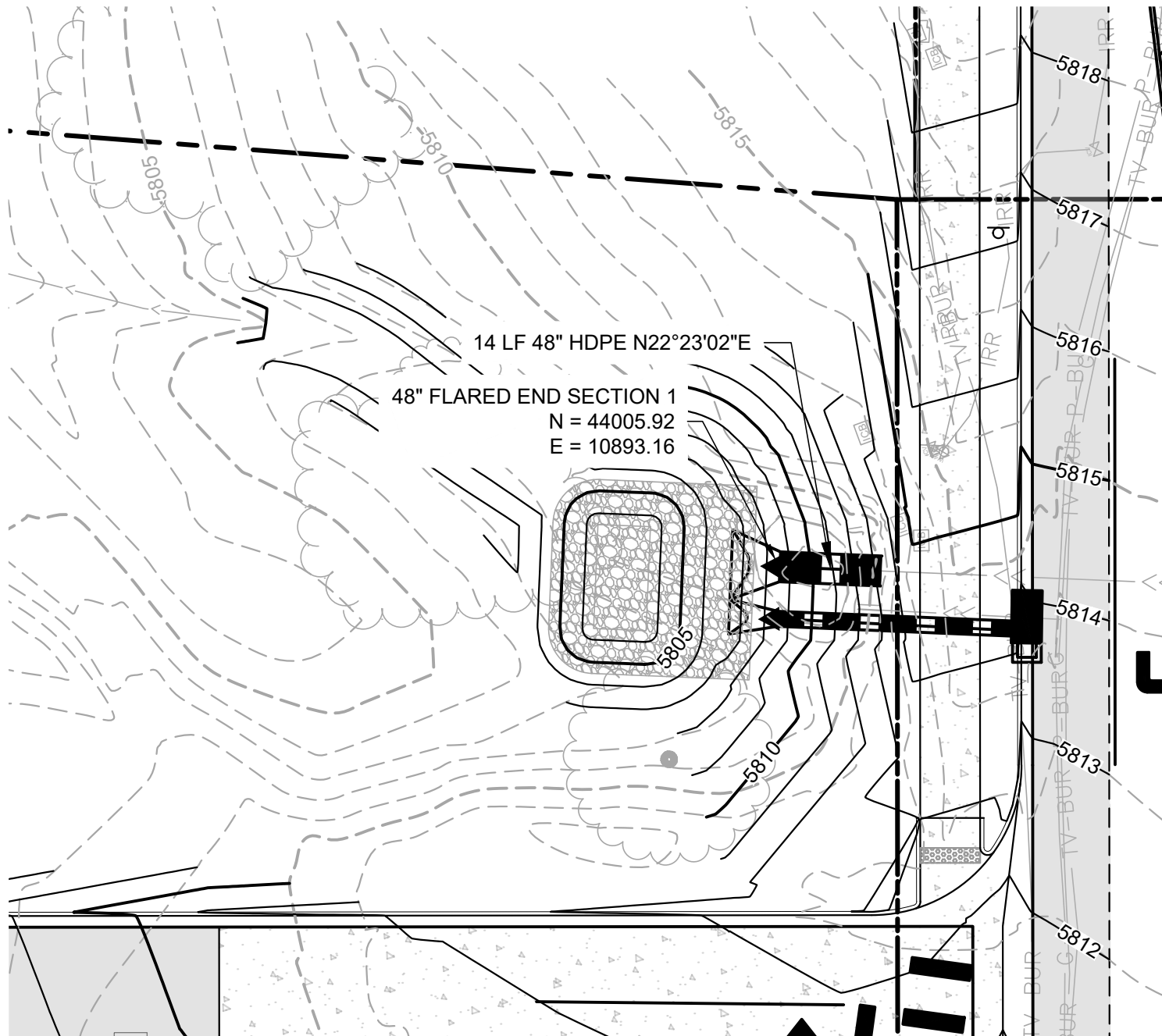
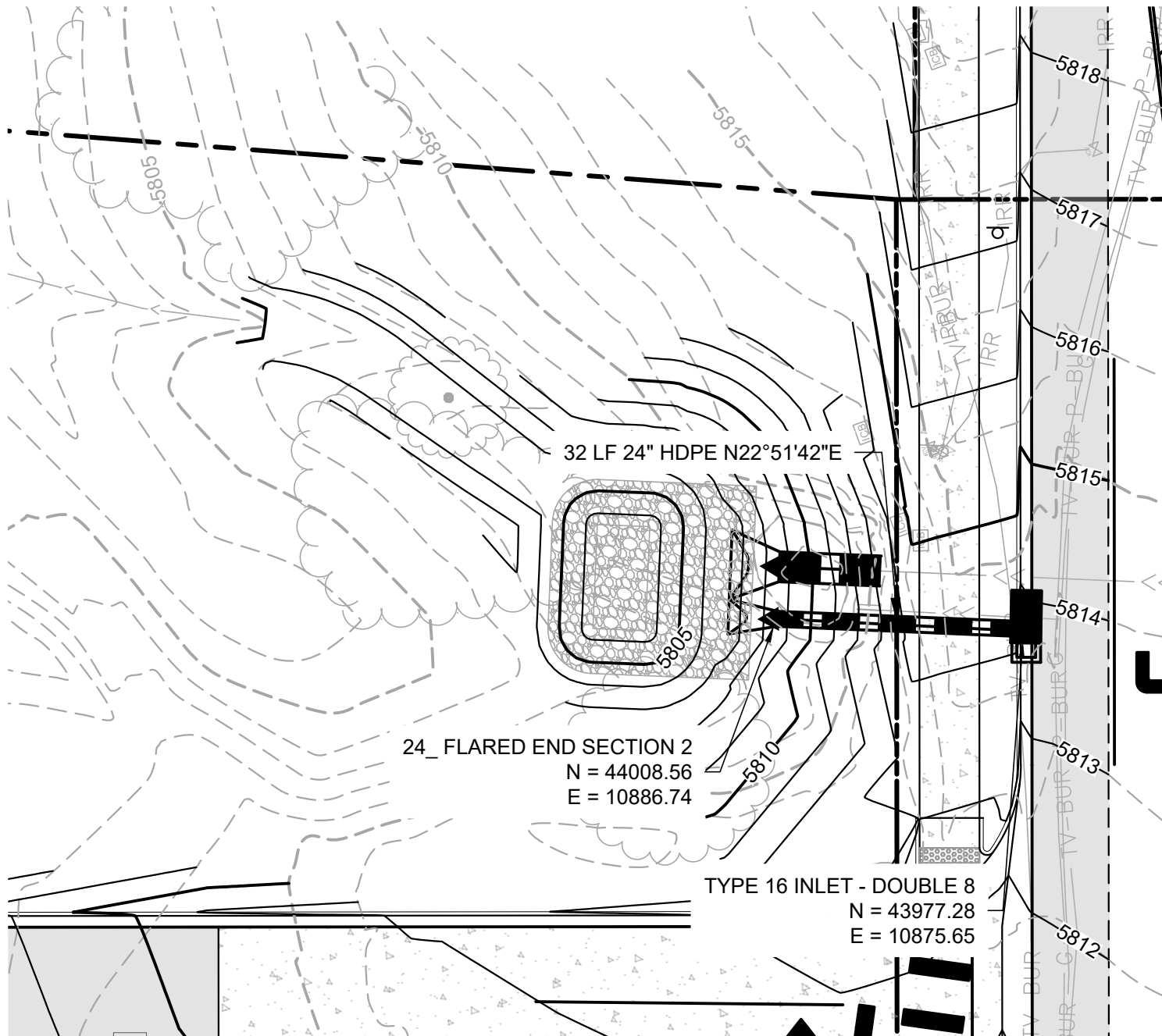


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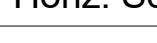


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| Print Date: 9/17/2024 9:24 AM                                                                                                                                                                                                                                                           |                       | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A STORM PLAN AND PROFILE |                        |              | Project No./Code |  |
| File Name: PH 6A - Storm Plan and Profile.dwg                                                                                                                                                                                                                                           |                       | Rev.                  | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |  |                                 |                        |              | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                       |                       | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      |  | Designer: T. Nuetzel            | Structure Numbers      | 25924        |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 | <input type="radio"/> |                       |          |                            |       |                                                                                                                                                                 |  | Void:         |  | Detailer: B. Risk               |                        | Sheet Number |                  |  |
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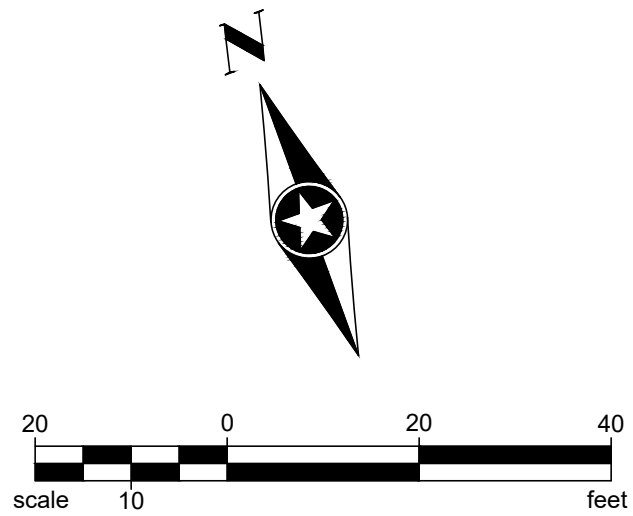
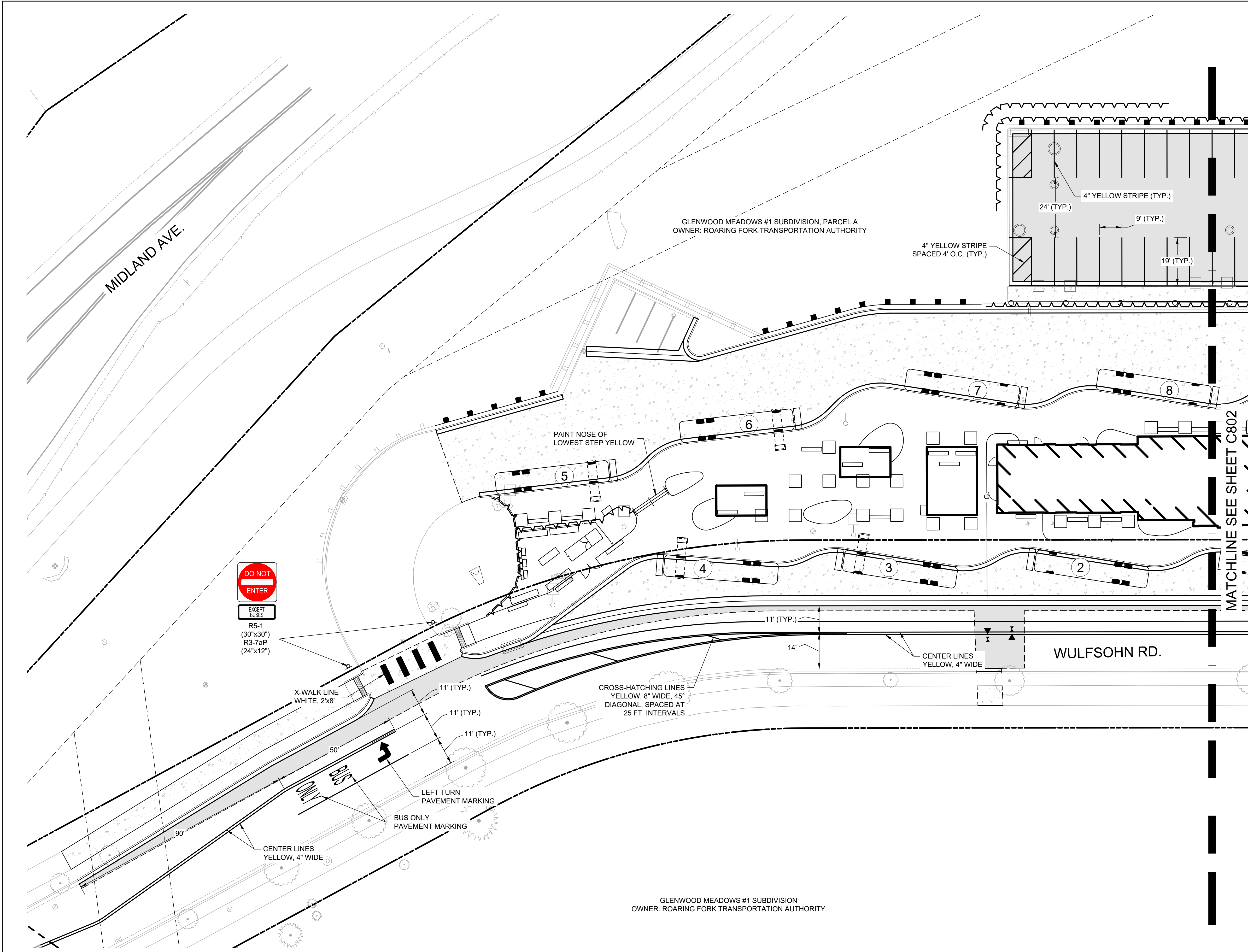


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| Print Date: 9/17/2024 9:24 AM                                                                                                                                                                                                                                                           |  | Sheet Revisions       |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans         |  | PHASE 6A STORM PLAN AND PROFILE |                        |              |  | Project No./Code |  |
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| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                       |  | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                     |  | Revised:          |  | Designer: T. Nuetzel            | Structure Numbers      | 25924        |  |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |  | <input type="radio"/> |          |                            |       |                                                                                                                                                                     |  | Detailer: B. Risk |  |                                 |                        | Sheet Number |  |                  |  |
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Horiz. Scale: As Noted

Vert. Scale: As Noted



Short Elliott Hendrickson Inc.

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| Sheet Revisions |          |                            |       |  |
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| Rev.            | Date     | Comments                   | Init. |  |
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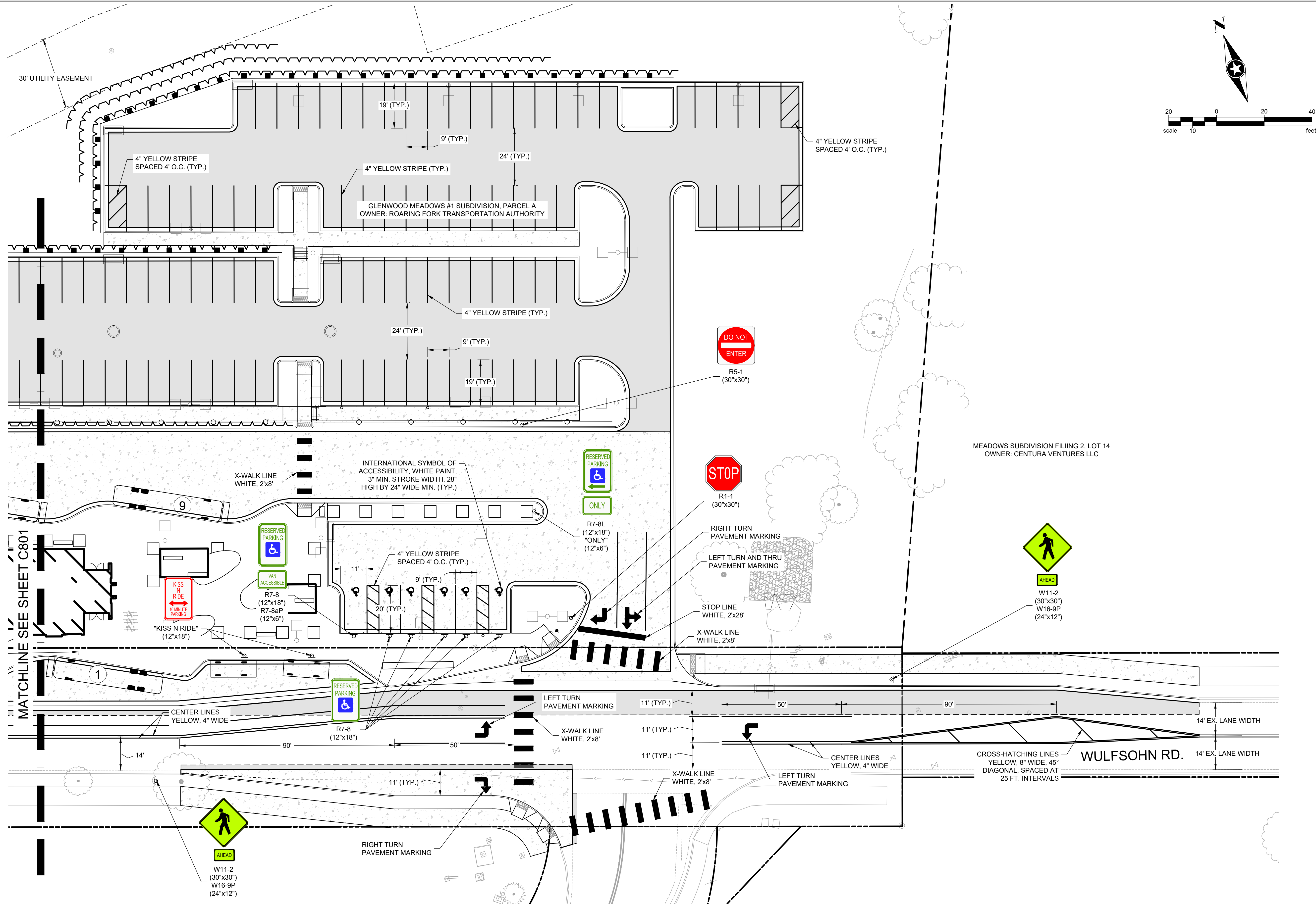
**WEST GLENWOOD TRANSIT CENTER  
AND ADMINISTRATION OFFICES**

2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     | PHASE 6A SIGNING AND STRIPING PLAN |                        |  | Project No./Code |
|---------------|------------------------------------|------------------------|--|------------------|
| No Revisions: |                                    |                        |  | TRG M535-014     |
| Revised:      | Designer: T. Nuetzel               | Structure Numbers      |  | 25924            |
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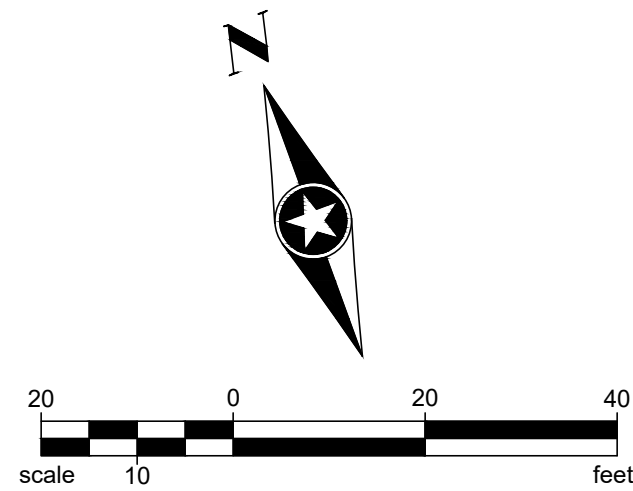
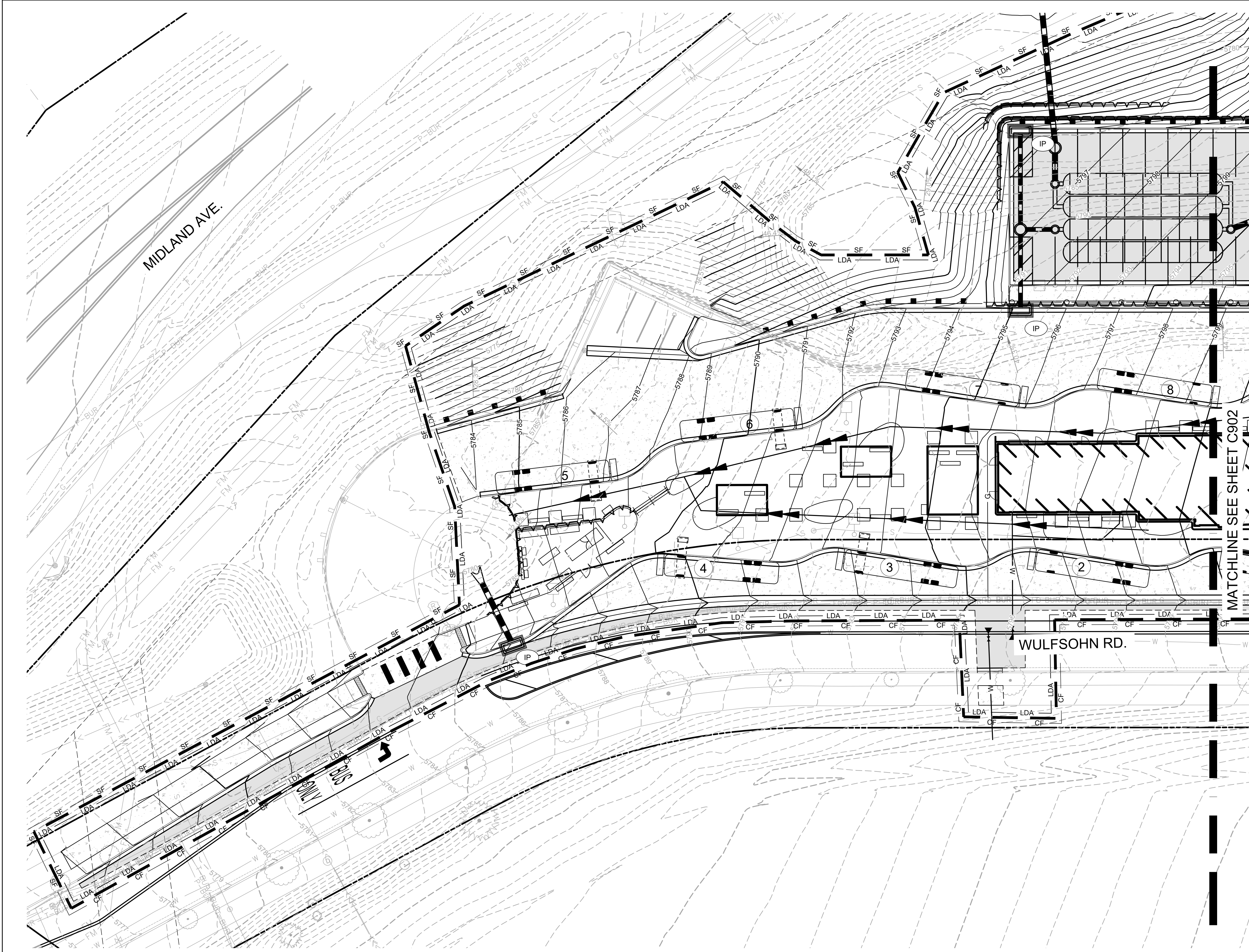
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| Print Date: 9/17/2024 9:26 AM                                                                                                                                                                                                                                                           |                      | Sheet Revisions      |          |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PHASE 6A SIGNING AND STRIPING PLAN |                   |              | Project No./Code |  |
| File Name: PH 6A - Signing and Striping Plan.dwg                                                                                                                                                                                                                                        |                      | Rev.                 | Date     | Comments                   | Init. |                                                                                                                                                                     |  | No Revisions: |  |                                    |                   |              | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                       |                      | <input type="text"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                     |  | Revised:      |  | Designer: T. Nuetzel               | Structure Numbers | 25924        |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 | <input type="text"/> |                      |          |                            |       |                                                                                                                                                                     |  | Void:         |  | Detailer: B. Risk                  |                   | Sheet Number |                  |  |
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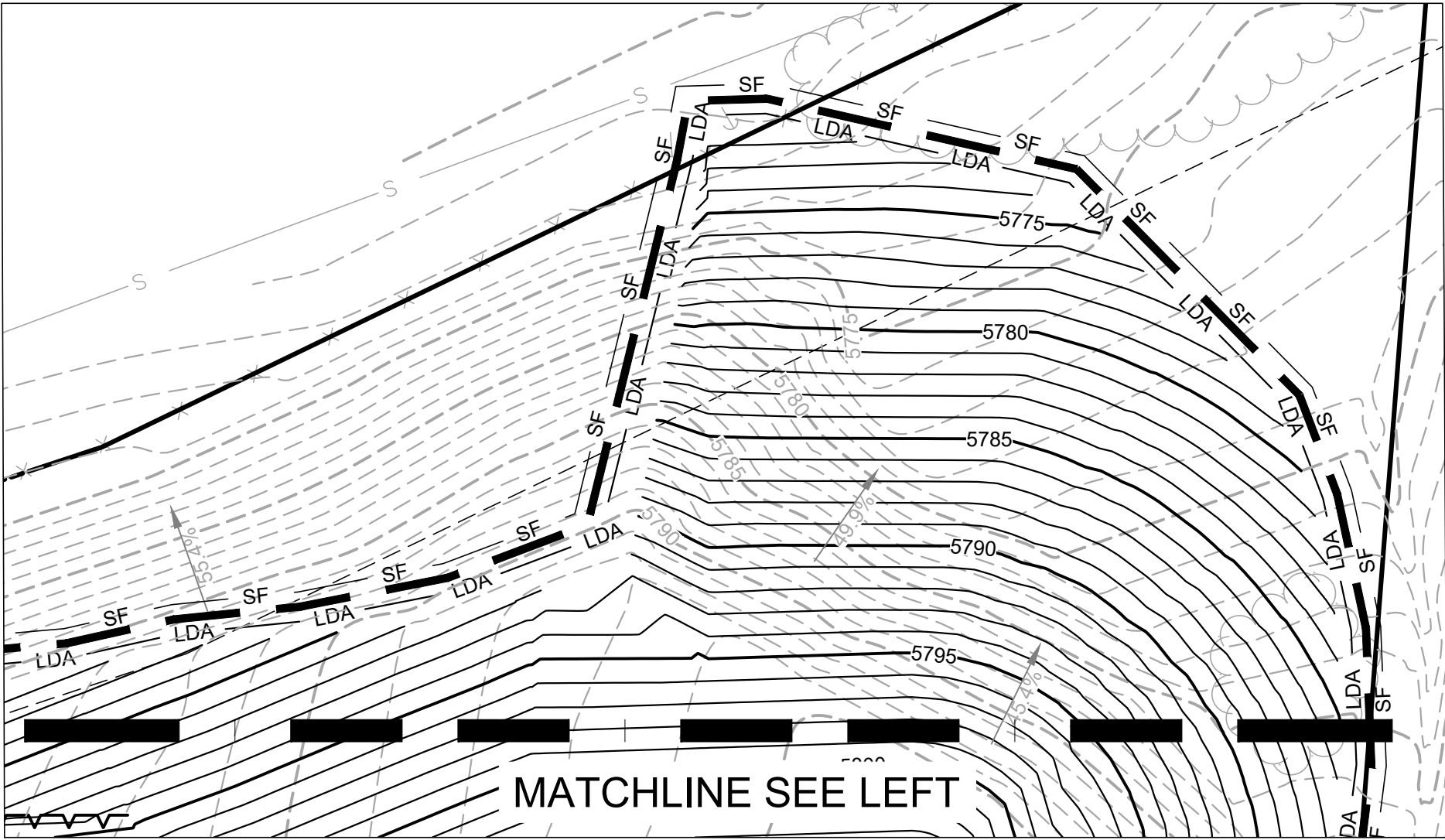


| BMP LEGEND |                            |
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|            | COMPOST BLANKET            |
|            | COMPOST FILTER BERM        |
|            | CONCRETE WASHOUT AREA      |
|            | CONSTRUCTION FENCE         |
|            | CONSTRUCTION MARKER        |
|            | DEWATERING                 |
|            | DIVERSION DITCH            |
|            | EROSION CONTROL BLANKET    |
|            | INLET PROTECTION           |
|            | REINFORCED CHECK DAM       |
|            | REINFORCED ROCK BERM       |
|            | RRB FOR CULVERT PROTECTION |
|            | SEDIMENT BASIN             |
|            | SEDIMENT CONTROL LOG       |
|            | SEDIMENT TRAP              |
|            | SEEDING AND MULCHING       |
|            | SILT FENCE                 |
|            | STABILIZED STAGING AREA    |
|            | SURFACE ROUGHENING         |
|            | TEMPORARY SLOPE DRAIN      |
|            | TEMPORARY STREAM CROSSING  |
|            | TERRACING                  |
|            | VEHICLE TRACKING CONTROL   |
|            | VTC WITH WHEEL WASH        |
|            | ROCK AND RIPRAP GRADATIONS |
|            | LIMITS OF CONSTRUCTION     |
|            | LIMITS OF DISTURBED AREA   |

|                                                                                                                                                                                                     |                       |                       |          |                            |                                                                                                                                                                 |               |                               |                        |  |                  |  |
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| Print Date: 9/17/2024 9:26 AM                                                                                                                                                                       |                       | Sheet Revisions       |          |                            | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER<br/>AND ADMINISTRATION OFFICES</b><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 | FIR Plans     | PHASE 6A EROSION CONTROL PLAN |                        |  | Project No./Code |  |
| File Name: PH 6A - Erosion Control Plan.dwg                                                                                                                                                         |                       |                       |          |                            |                                                                                                                                                                 |               |                               |                        |  | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                              | Vert. Scale: As Noted | Rev.                  | Date     | Comments                   | Init.                                                                                                                                                           | No Revisions: | Designer: T. Nuetzel          | Structure Numbers      |  | 25924            |  |
| Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                       | <input type="radio"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR                                                                                                                                                           | Revised:      | Detailer: B. Risk             |                        |  | Sheet Number     |  |
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- BMP LEGEND**
- CD CHECK DAM
  - CB COMPOST BLANKET
  - CFB COMPOST FILTER BERM
  - CWA CONCRETE WASHOUT AREA
  - CF CONSTRUCTION FENCE
  - CM CONSTRUCTION MARKER
  - DW DEWATERING
  - DD DIVERSION DITCH
  - ECB EROSION CONTROL BLANKET
  - IP INLET PROTECTION
  - RCD REINFORCED CHECK DAM
  - RRB REINFORCED ROCK BERM
  - RRC RRB FOR CULVERT PROTECTION
  - SB SEDIMENT BASIN
  - SCL SEDIMENT CONTROL LOG
  - ST SEDIMENT TRAP
  - SM SEEDING AND MULCHING
  - SF SILT FENCE
  - SSA STABILIZED STAGING AREA
  - SR SURFACE ROUGHENING
  - TSD TEMPORARY SLOPE DRAIN
  - TSC TEMPORARY STREAM CROSSING
  - TER TERRACING
  - VTC VEHICLE TRACKING CONTROL
  - VWC VTC WITH WHEEL WASH
  - WW ROCK AND RIPRAP GRADATIONS
  - LOC LIMITS OF CONSTRUCTION
  - LDA LIMITS OF DISTURBED AREA

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File Name: PH 6A - Erosion Control Plan.dwg  
Horiz. Scale: As Noted Vert. Scale: As Noted

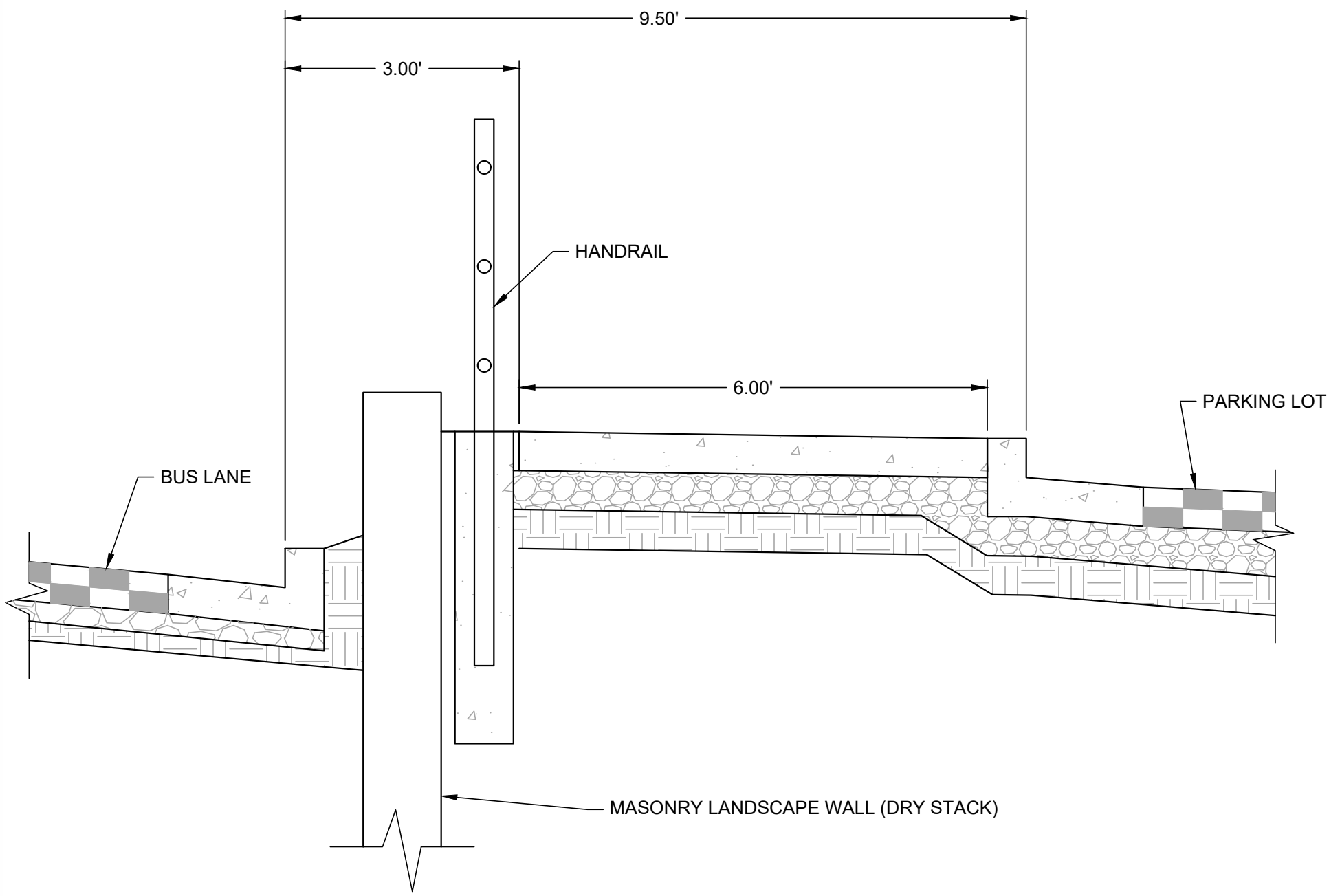
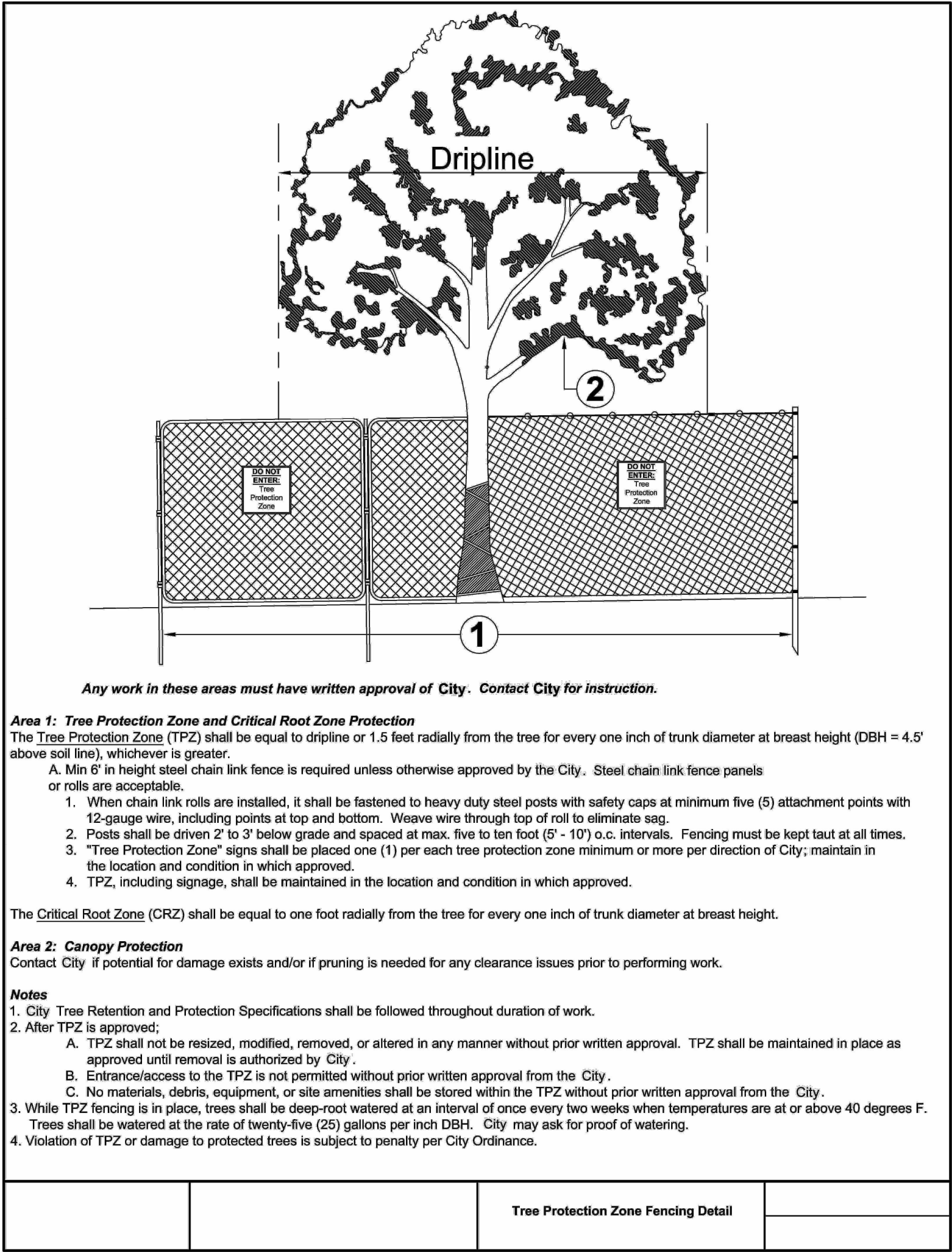
**SEH** Short Elliott Hendrickson Inc.  
Colorado Center Tower One  
Suite 6000  
2000 South Colorado Boulevard  
Denver, CO 80222-7900  
Tele. (720) 540-6800  
(800) 490-4966  
Fax (720) 540-6801

| Sheet Revisions |          |                            |       |
|-----------------|----------|----------------------------|-------|
| Rev.            | Date     | Comments                   | Init. |
| 01              | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |
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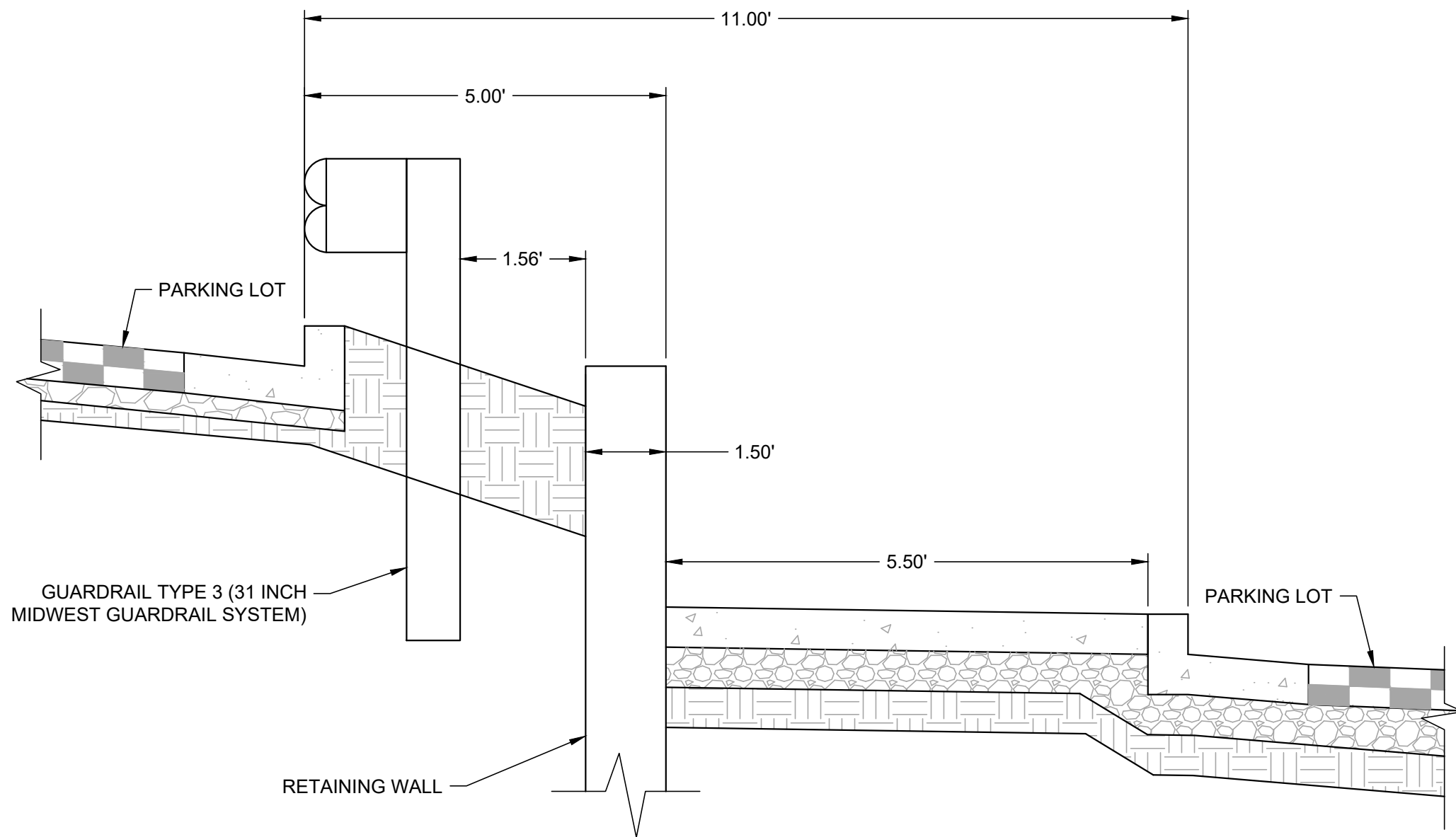
ROARING FORK TRANSPORTATION AUTHORITY  
**WEST GLENWOOD TRANSIT CENTER  
AND ADMINISTRATION OFFICES**  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     |  | PHASE 6A EROSION CONTROL PLAN |  | Project No./Code |
|---------------|--|-------------------------------|--|------------------|
| No Revisions: |  | Designer: T. Nuetzel          |  | TRG M535-014     |
| Revised:      |  | Detailer: B. Risk             |  | 25924            |
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|               |  | Structure Numbers             |  |                  |
|               |  | Subset Sheets: C902 of        |  |                  |





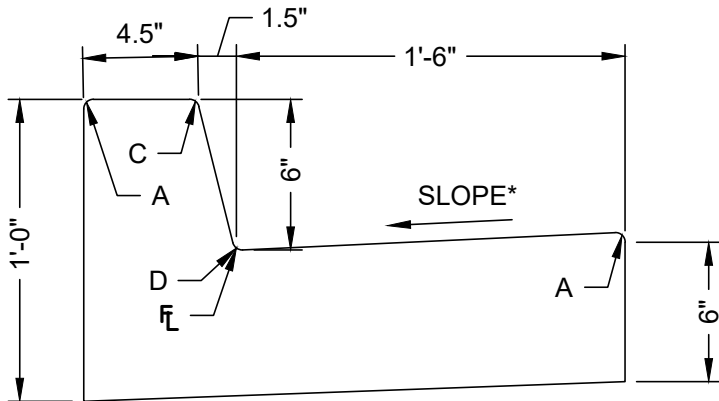
TYPICAL SECTION ADJACENT TO BUS LANE  
NTS



TYPICAL SECTION BETWEEN PARKING LOTS  
NTS

GENERAL NOTES

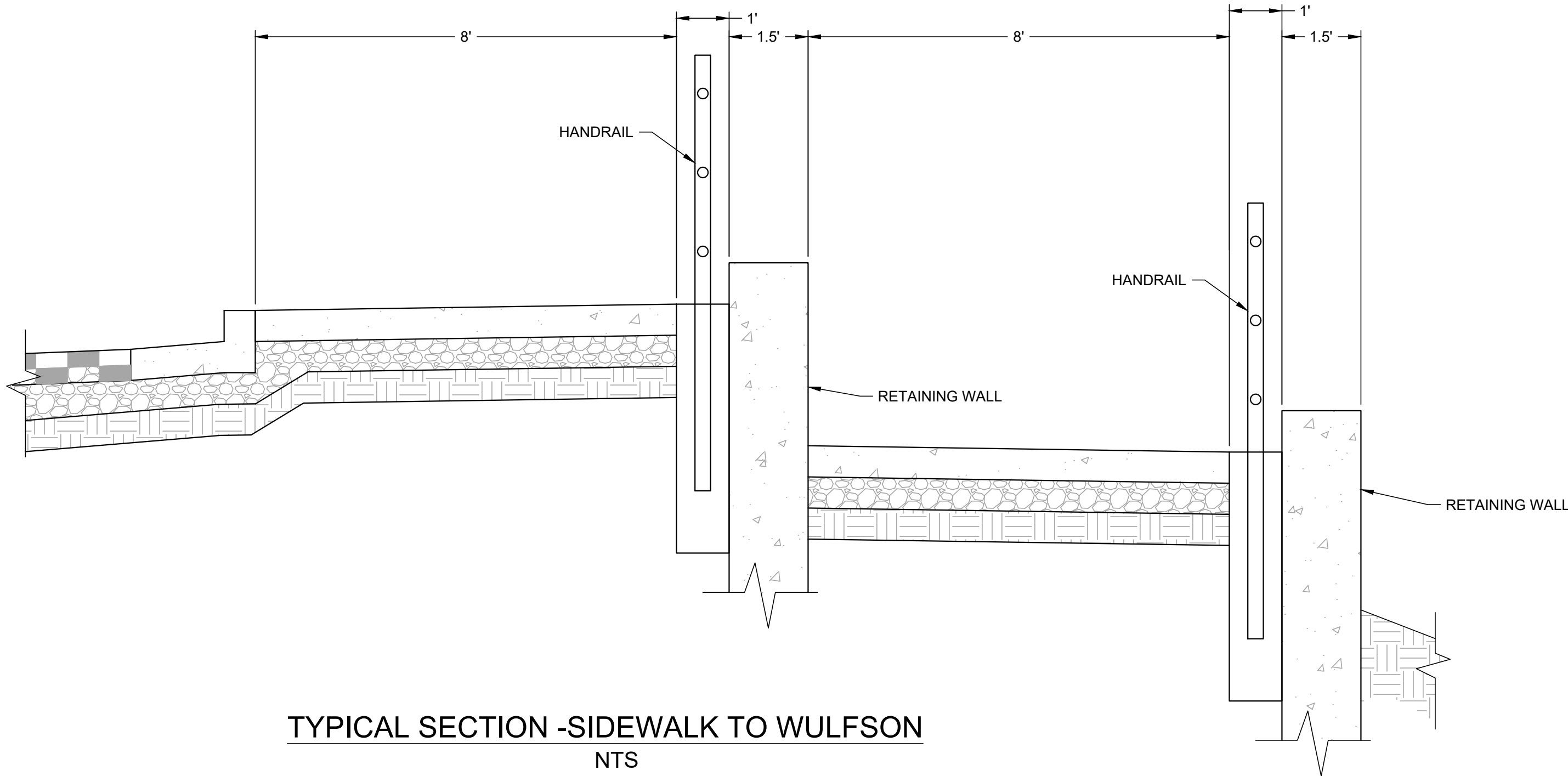
- CONCRETE SHALL BE CLASS B.
- PROFILE GRADE OF CURBS AND GUTTERS SHALL BE LOCATED AT THE FLOW LINE.
- GUTTER CROSS SLOPES MAY BE ADJUSTED TO FACILITATE DRAINAGE FOR PROFILE GRADES AS SHOWN ON THE PLANS.
- THICKNESS OF CURB AND GUTTER SECTION SHALL MATCH CONCRETE PAVEMENT THICKNESS IF SHOWN ON THE PLANS. CURB AND GUTTER SHALL BE CLASS P CONCRETE IF PLACED MONOLITHICALLY WITH CONCRETE PAVEMENT.
- INCREASE SIDEWALK THICKNESS TO 6 IN. AT LOCATIONS SHOWN ON THE PLANS.
- WHEN TIE BARS ARE REQUIRED, THE GUTTER THICKNESS SHALL BE INCREASED TO THE PAVEMENT THICKNESS (T). BARS SHALL BE EPOXY-COATED #4 CONFORMING TO AASHTO M 284 AND SPACED AT 3 FT. INTERVALS. THEY SHALL BE INSERTED T/2 AND 1#2 LENGTH INTO THE GUTTER.



\*GUTTER SLOPE EQUALS 1"/FT. WHEN ADJACENT TO ASPHALT PAVEMENT. GUTTER SLOPE TO MATCH ADJACENT CONCRETE SLOPE WHEN ADJACENT TO CONCRETE PAVEMENT.

| LEGEND FOR RADII |                |
|------------------|----------------|
| A                | = 1/8" TO 1/4" |
| B                | = 1"           |
| C                | = 1 1/2"       |
| D                | = 1 1/2" TO 2" |

CURB AND GUTTER TYPE 2 (SECTION B) (1.5' GUTTER)  
NTS

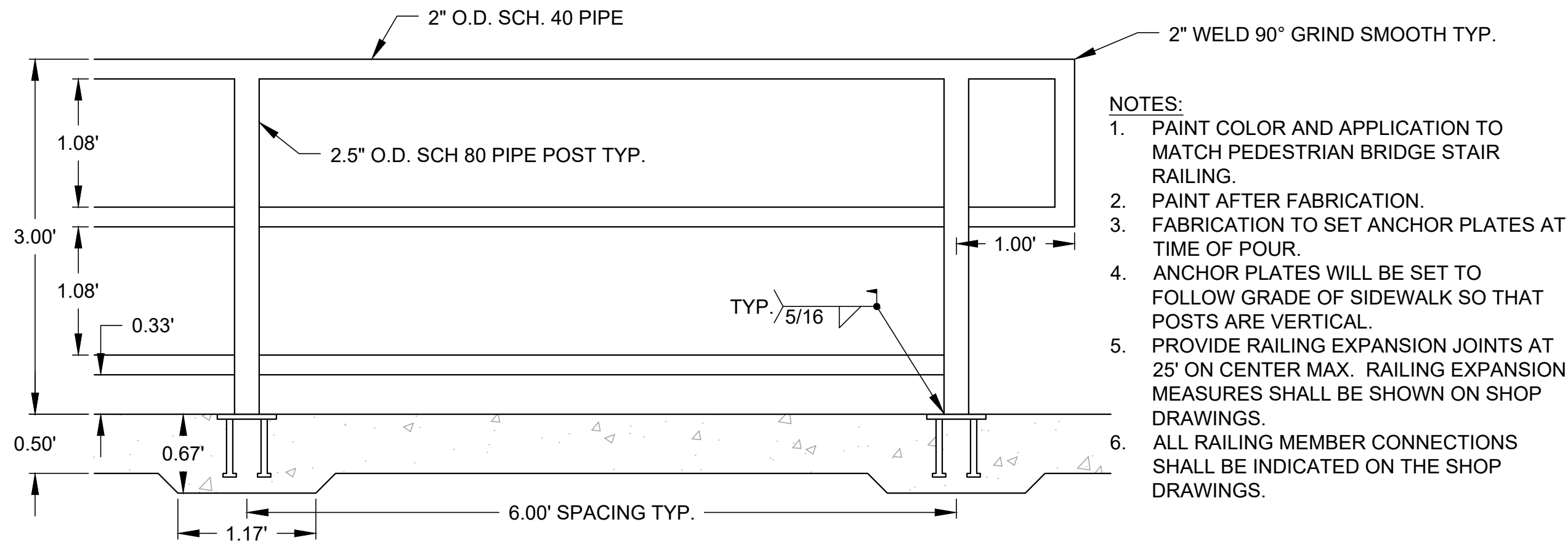


TYPICAL SECTION -SIDEWALK TO WULFSON  
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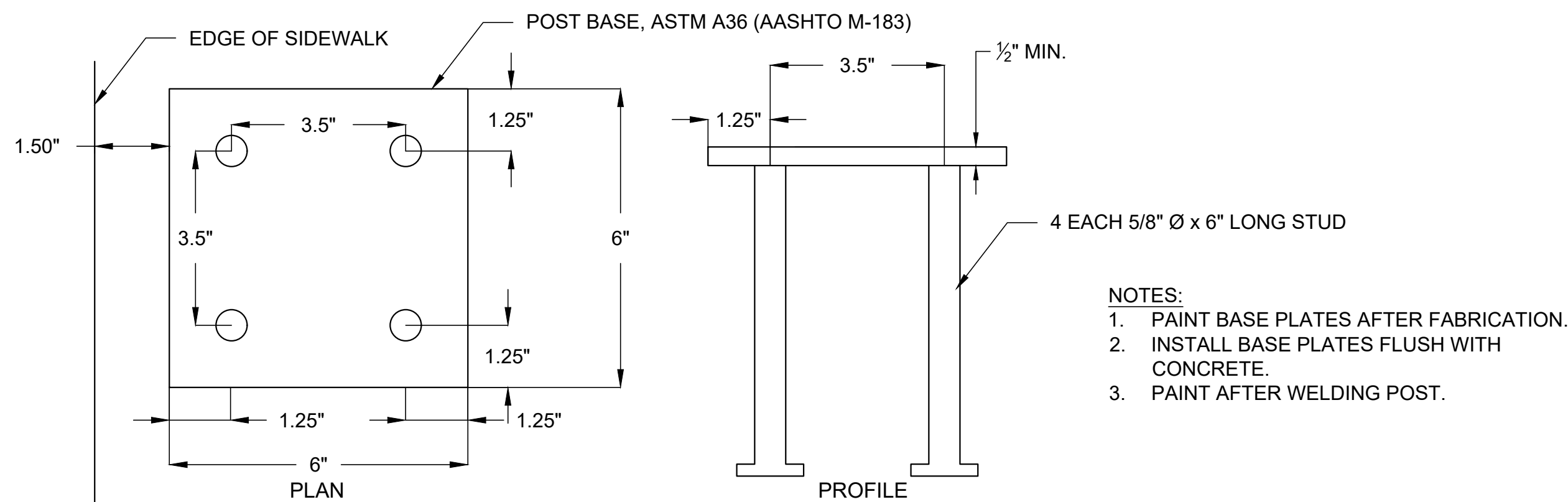
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| File Name: Civil Details.dwg                                                                                                                                                                                                                                                            | Rev.            | Date     | Comments                   | Init. |                                                                                                                                                                 | No Revisions: |  | TRG M535-014           |                        |                  |
| Horiz. Scale: As Noted Vert. Scale: As Noted                                                                                                                                                                                                                                            |                 | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 | Revised:      |  | Designer: T. Nuetzel   | Structure Numbers      | 25924            |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                 |          |                            |       |                                                                                                                                                                 | Void:         |  | Detailer: B. Risk      | Sheet Subset: C1001 of | Sheet Number     |



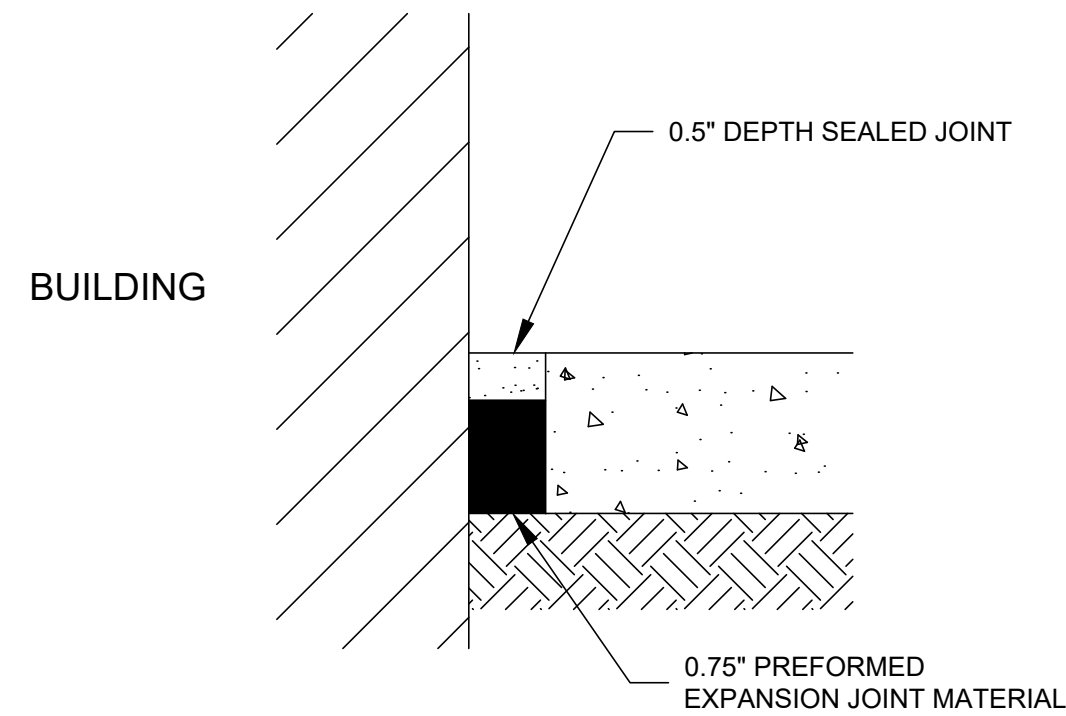
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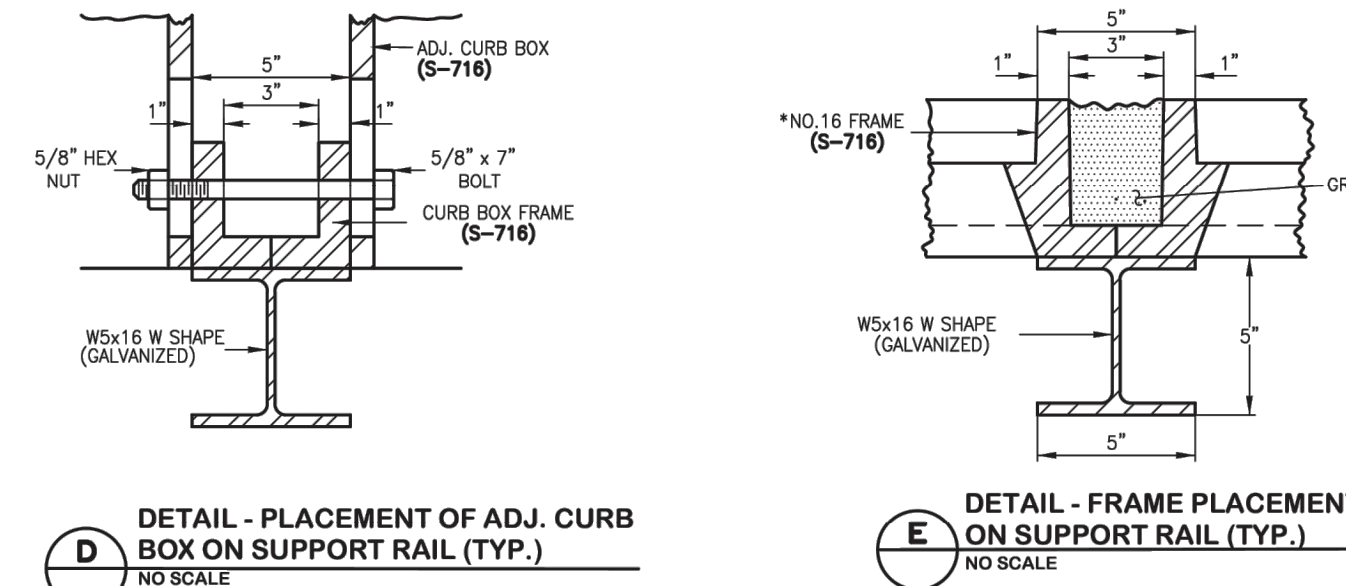
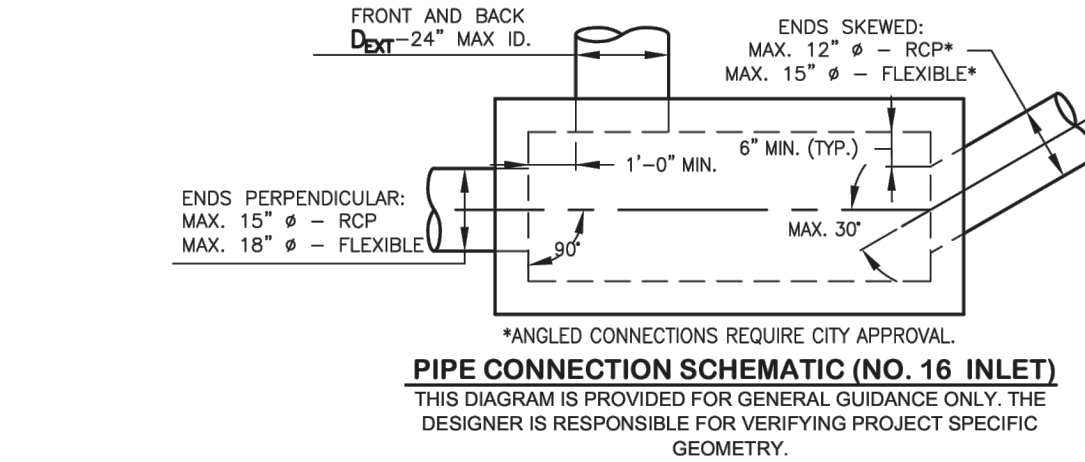
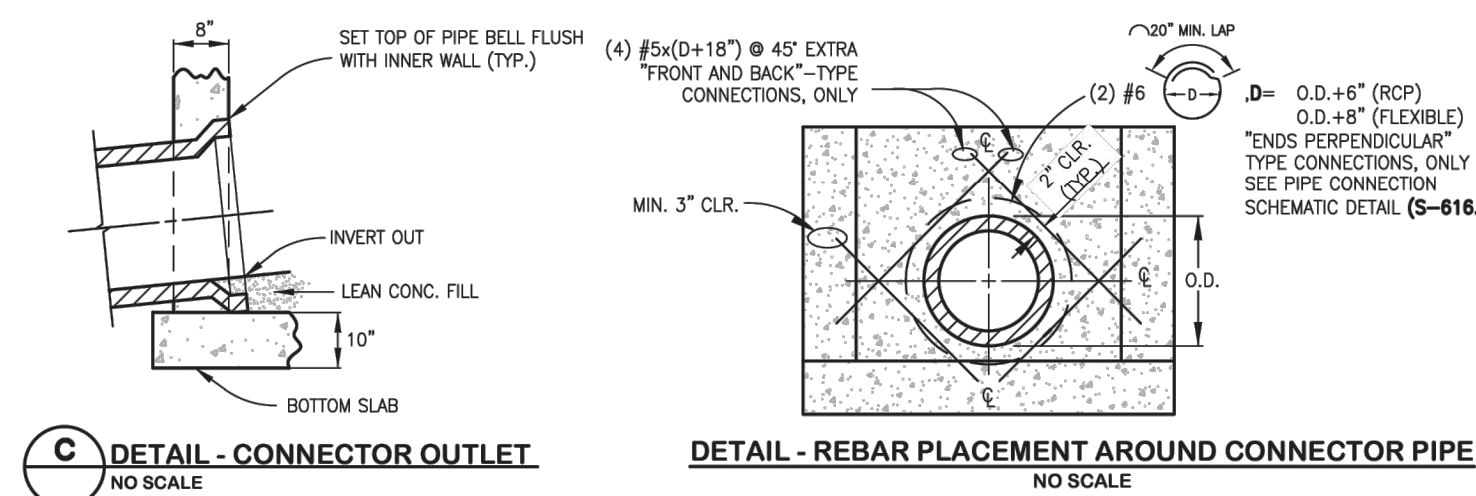
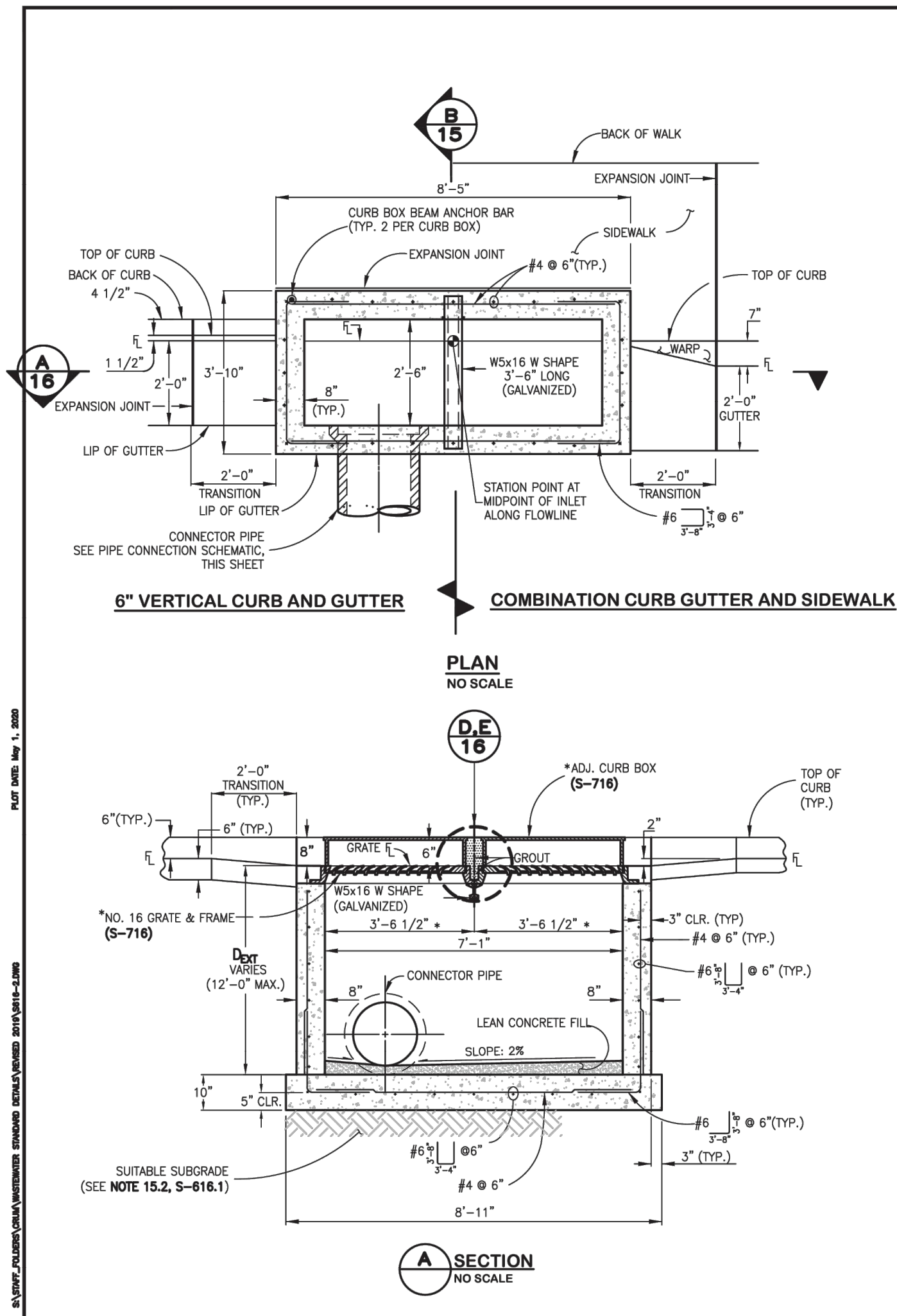


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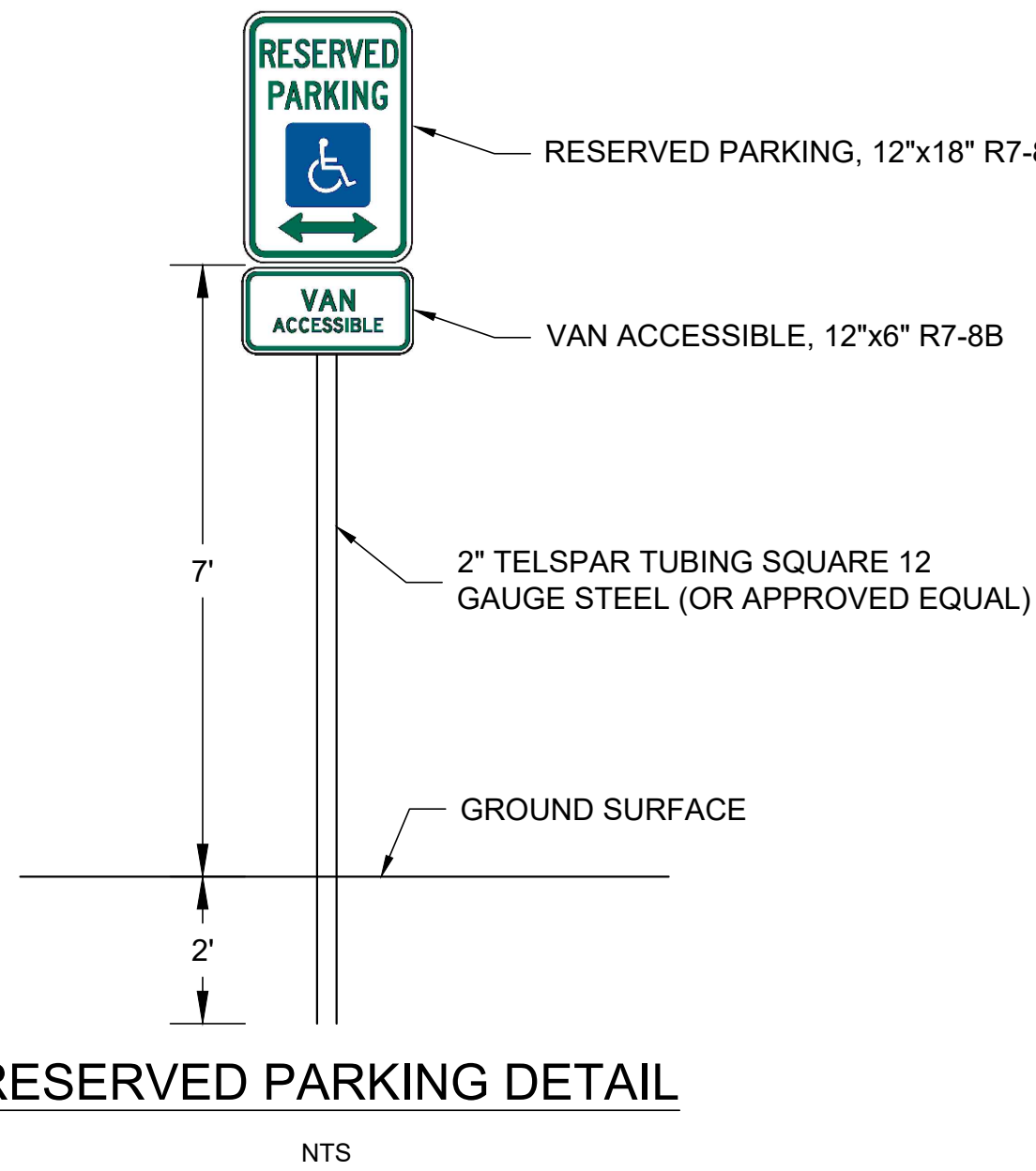


SIDEWALK EXPANSION JOINT AT BUILDINGS

N.T.S.



- DOUBLE NUMBER 16 INLET NOTES:**
- 16.1 SEE DETAIL SPECIFICATIONS SECTION 11.05 STORM INLETS FOR MORE INFORMATION. USE OF THIS DETAIL WITHOUT SPECIFICATIONS SHALL BE CONSIDERED NON-COMPLIANT.
  - 16.2 SEE GENERAL NOTES ON S-616.1.
  - 16.3 EXPANSION JOINT MATERIAL SHALL BE PLACED FULL DEPTH OF THE CURB AND GUTTER, SIDEWALK, CONCRETE PAVEMENT, AS APPLICABLE. THE TOP PORTION OF THE JOINT SHALL BE SEALED WITH SILICONE SEALANT.
  - 16.4 SEE S-616.1 FOR REBAR PLACEMENT AT WALL PENETRATION DETAIL.
- \* STANDARD DETAIL S-716 APPLIES TO ALL OF THE GRATE & FRAME GEOMETRIC DIMENSIONS FOR THE DOUBLE NUMBER 16 INLET EXCEPT FOR THE FRAME LENGTH. FRAME LENGTH SHOULD BE MANUFACTURED FOR THE DIMENSIONS CALLED OUT ON THIS SHEET.



RESERVED PARKING DETAIL

N.T.S.

|                                |                      |
|--------------------------------|----------------------|
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| Suite 6000                     | Fax (720) 540-6801   |
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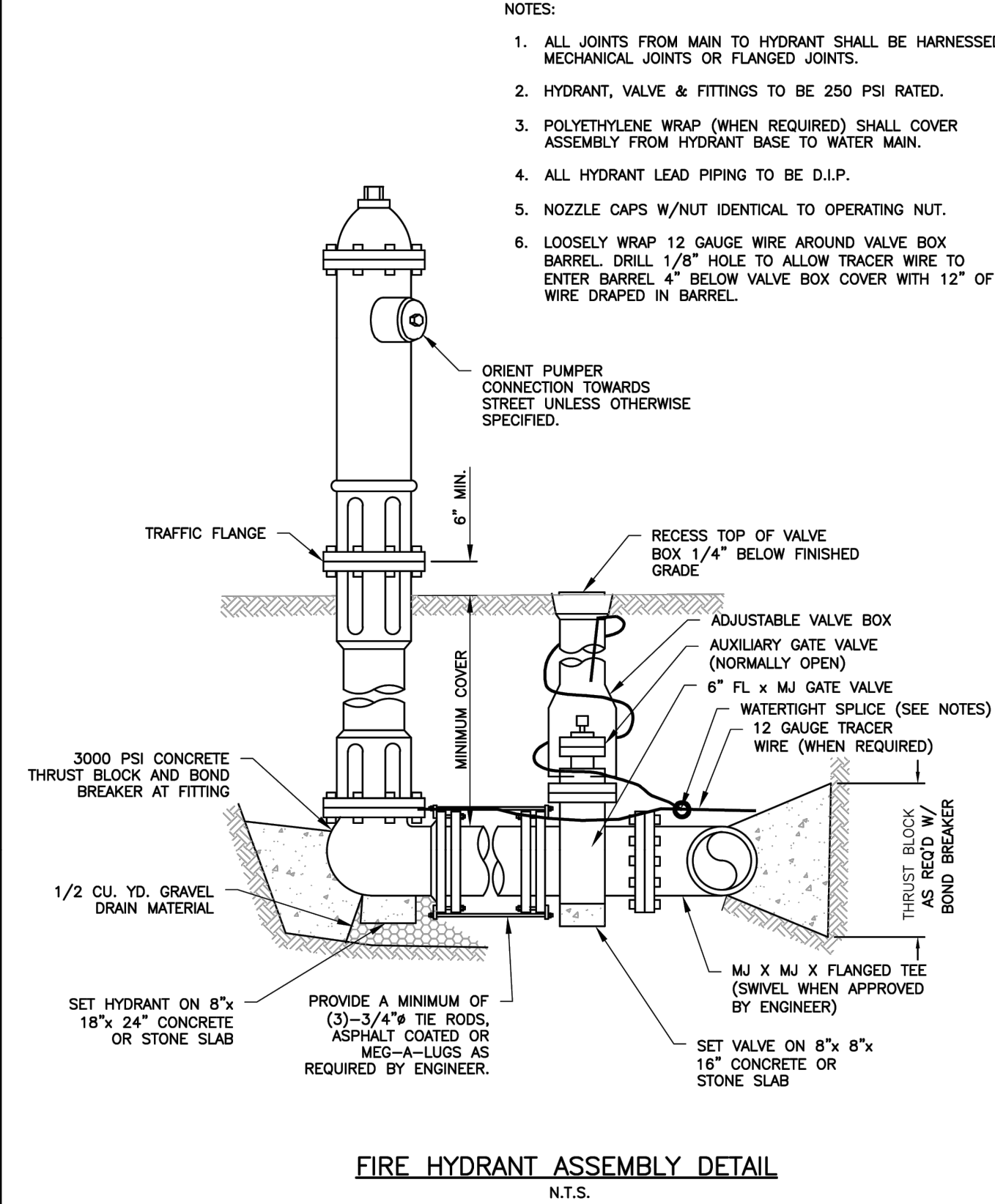
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| FIR Plans     |  |
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| Revised:      |  |
| Void:         |  |

| PHASE 6A CIVIL DETAILS |                         |           |  |
|------------------------|-------------------------|-----------|--|
| Designer:              | T. Nuetzel              | Structure |  |
| Detailer:              | B. Risk                 | Numbers   |  |
| Sheet Subset:          | Subset Sheets: C1002 of |           |  |

| Project No./Code |  |
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| TRG M535-014     |  |
| 25924            |  |
| Sheet Number     |  |





FIRE HYDRANT ASSEMBLY DETAIL  
N.T.S.



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101 West 8th Street  
Glenwood Springs, CO 81601  
970.384.6435  
www.ci.glenwood-springs.co.us

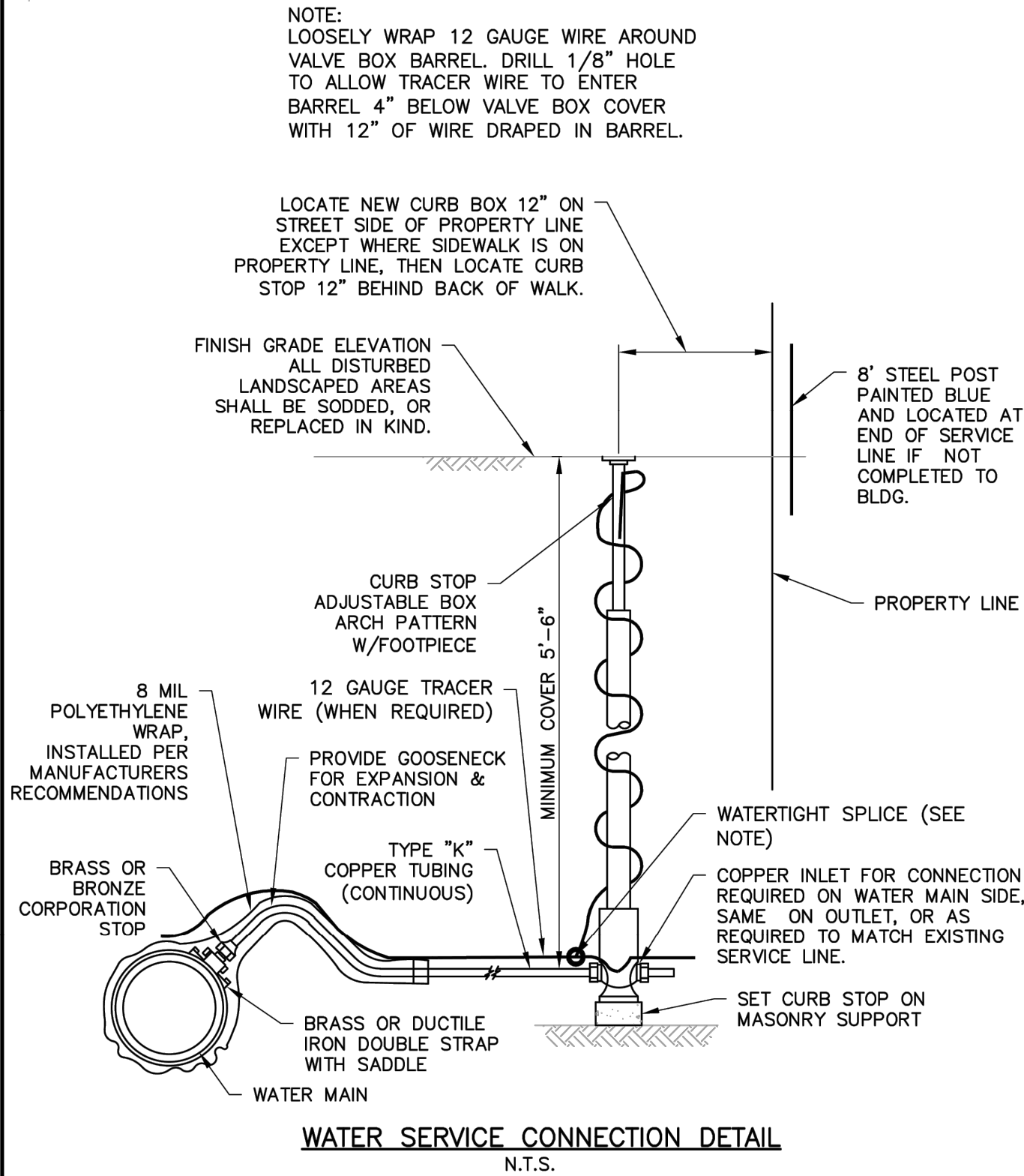
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WATER SERVICE CONNECTION DETAIL  
N.T.S.



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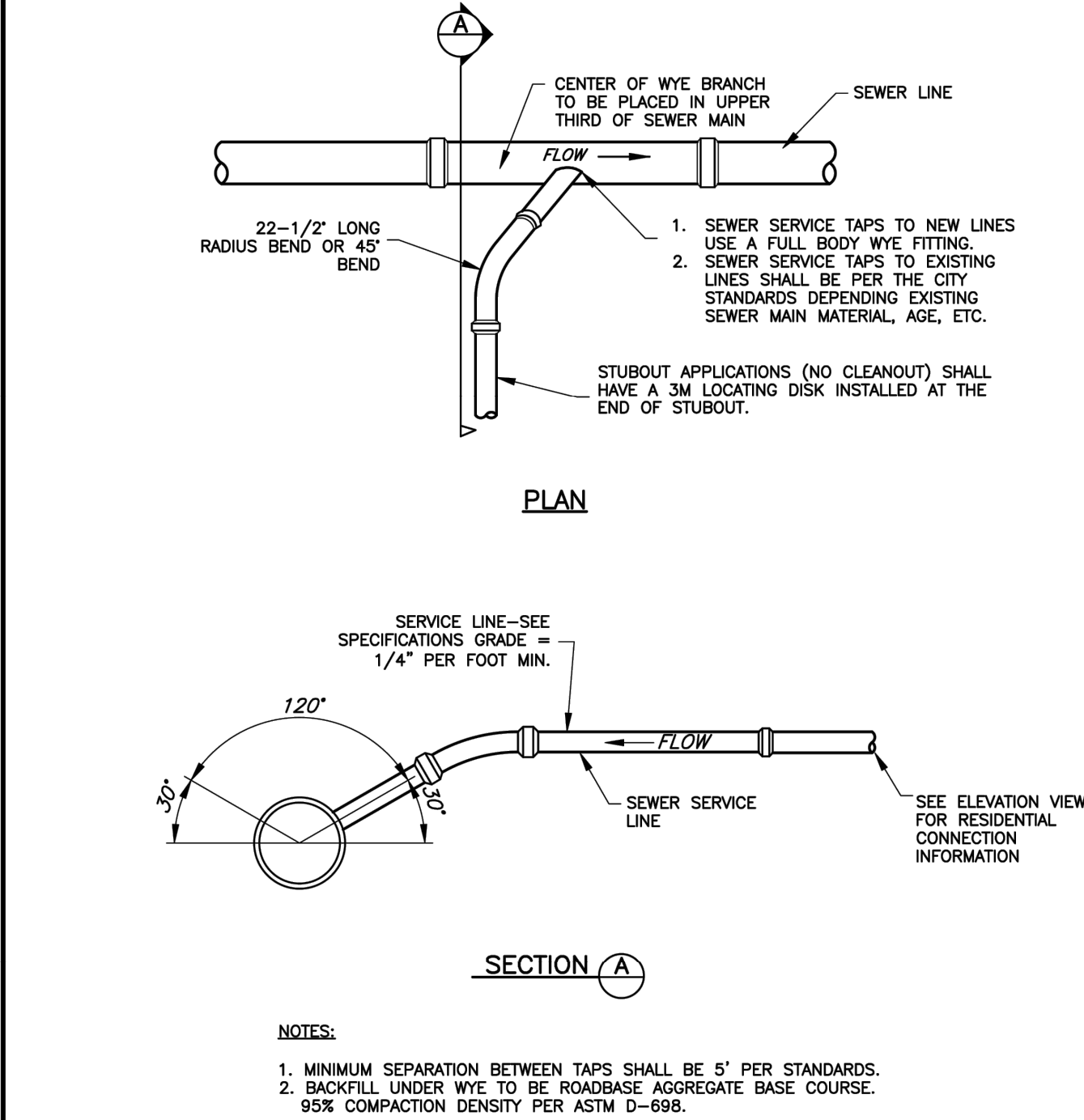
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SEWER SERVICE CONNECTION  
N.T.S.



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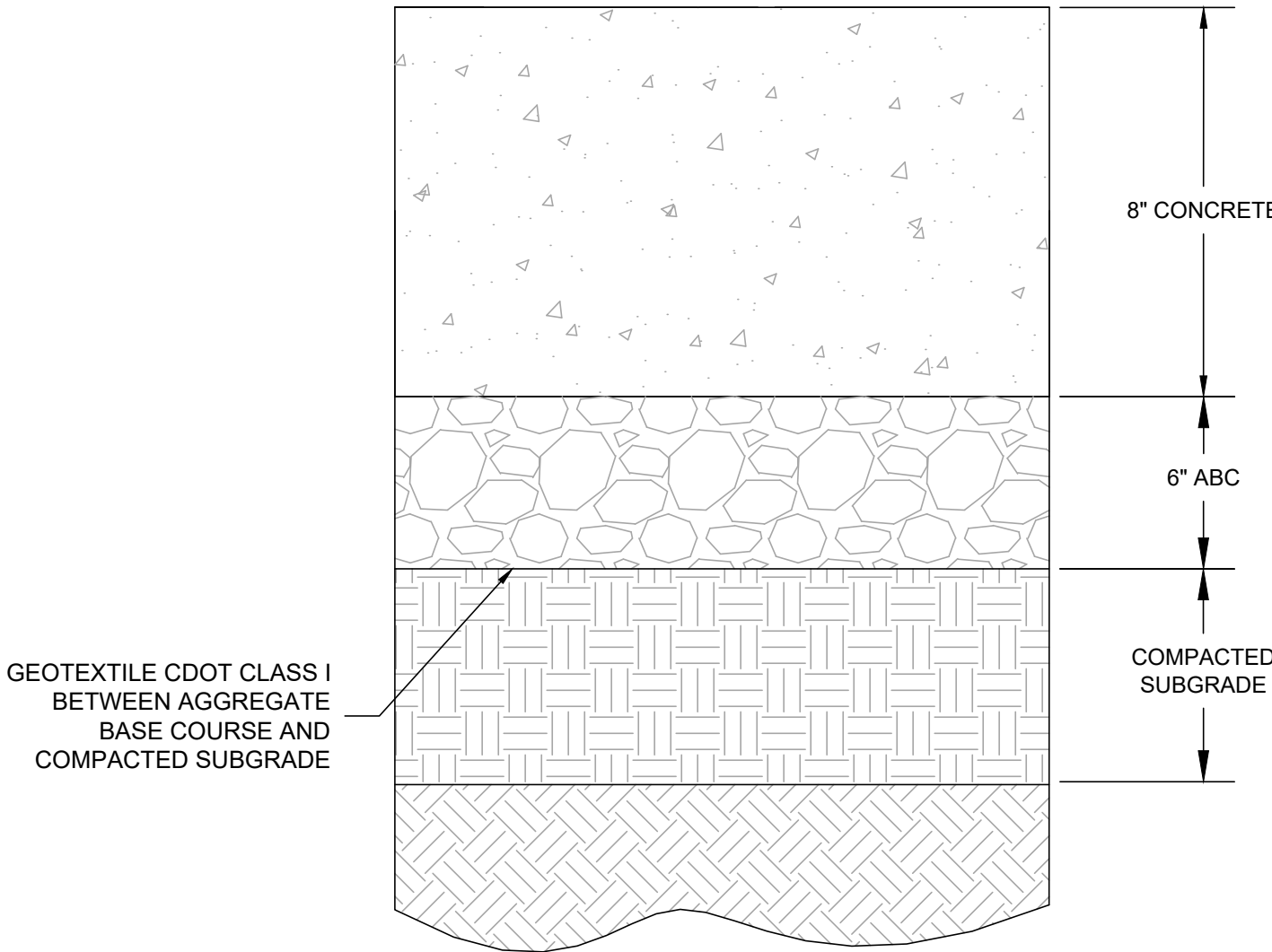
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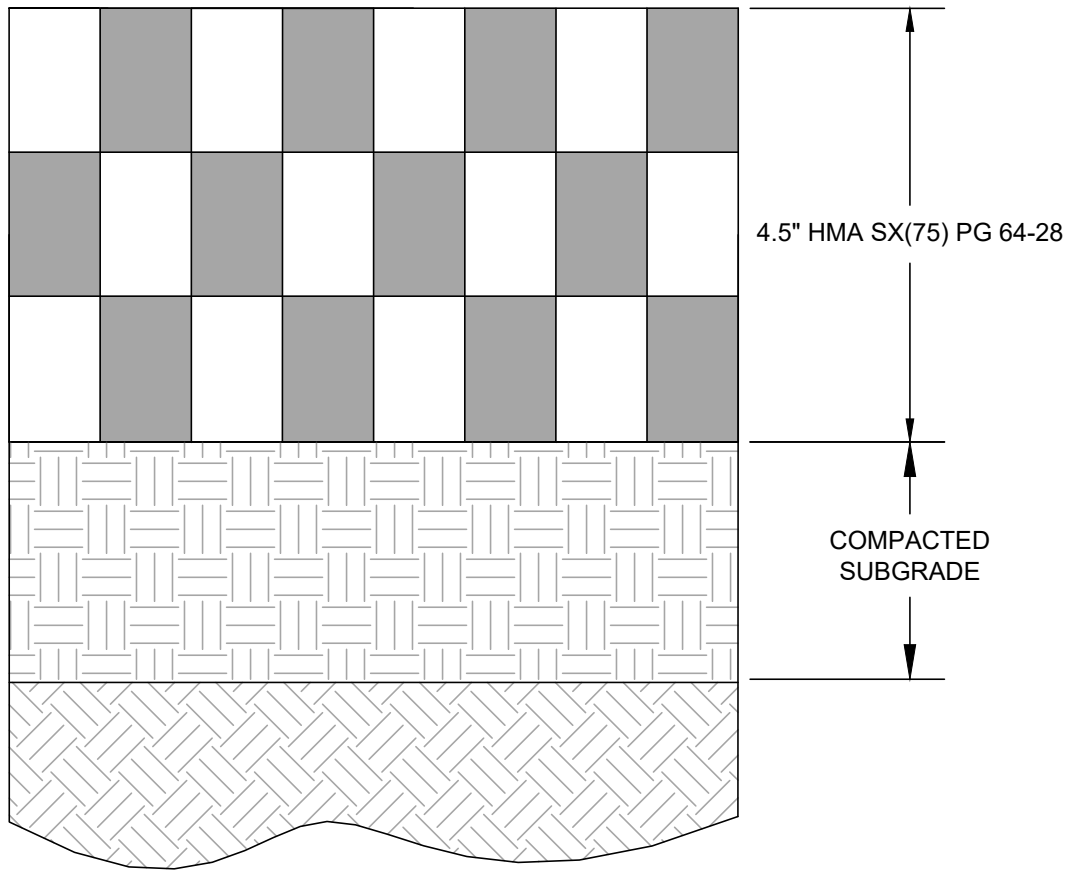
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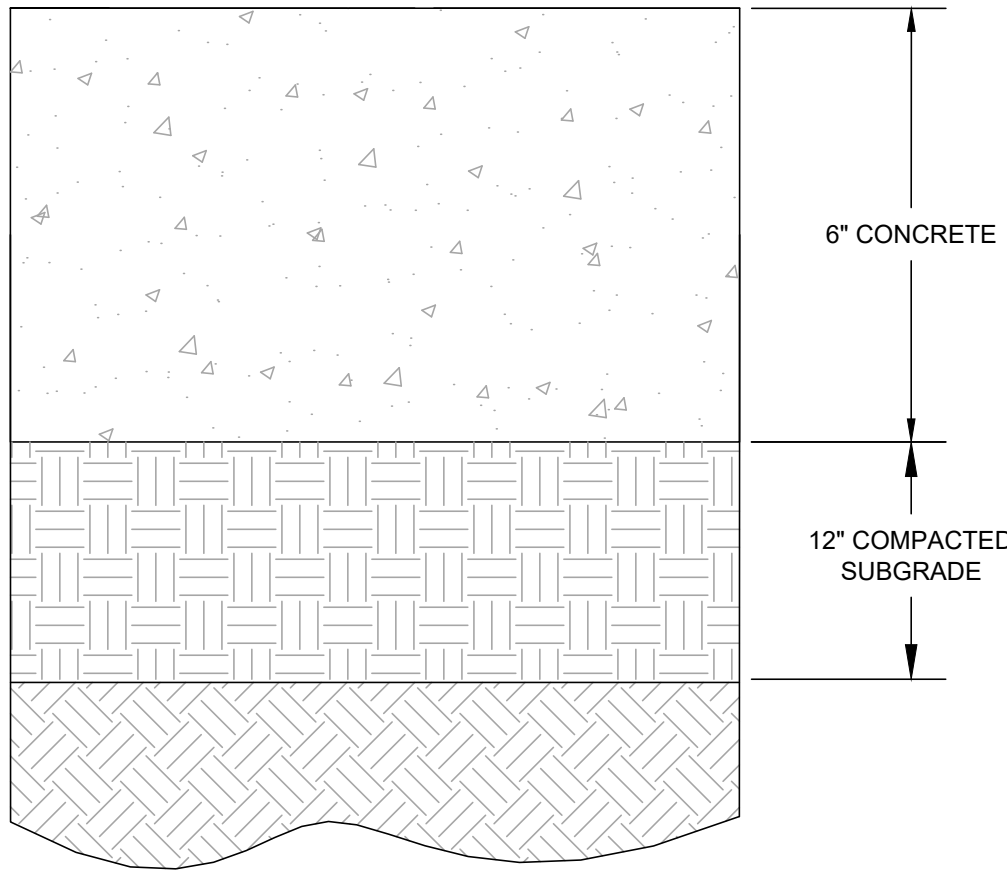
CONCRETE PAVEMENT  
SECTION

NTS



ASPHALT PAVEMENT  
SECTION

NTS



CONCRETE SIDEWALK  
SECTION

NTS

PAVEMENT NOTES:

ABC: CDOT CLASS 6 AGGREGATE BASE COURSE

PAVEMENT COMPACTED SUBGRADE: THE COLLAPSING SOILS HAVE TO BE ADDRESSED BEFORE ANY PAVEMENT OR STRUCTURE IS CONSTRUCTED AT THIS SITE BY SUBEXCAVATING THE TOP 5 FEET OF THE EXISTING SOIL AND RECOMPACTING IT AT OPTIMUM OR ABOVE OPTIMUM MOISTURE CONTENT, REMOVING AND REPLACING THE EXISTING COLLAPSING SOIL AND PLACING SELECT MATERIAL AT A DEPTH SUFFICIENT TO MINIMIZE COLLAPSING OR SETTLEMENT OR IMPORTING ADDITIONAL FILL AND ALLOWING IT TO SETTLE BEFORE CONSTRUCTION.

SIDEWALK COMPACTED SUBGRADE: SUBEXCAVATION OF 12 INCHES BELOW GRADE FOR PROPOSED SIDEWALK CONSTRUCTION. NATURAL LOOSE SAND AND GRAVEL SOILS BELOW THE SUBGRADE SHALL BE REMOVED AND REPLACED AS RECOMMENDED ABOVE. GREATER DEPTHS OF MOISTURE-DENSITY CONDITIONING OF THE SUBGRADE SOILS MAY BE NEEDED LOCALLY, DEPENDING ON THE CONDITIONS EXPOSED.

PAVEMENT PROOFROLLING: THE PAVEMENT SUBGRADE SHOULD BE PROOF ROLLED WITH A HEAVILY LOADED PNEUMATIC-TIRE VEHICLE. AREAS THAT DEFORM MORE THAN 1/2-INCH UNDER HEAVY WHEEL LOADS SHOULD BE REMOVED, REPLACED IF NECESSARY, AND REWORKED TO ACHIEVE A STABLE SUBGRADE PRIOR TO PAVING. WE RECOMMEND THAT PROOF ROLLING AND COMPACTION TESTS BE OBSERVED AND DOCUMENTED BY A REPRESENTATIVE OF A REGISTERED PROFESSIONAL ENGINEER.

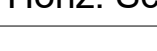
SIDEWALK PROOFROLLING: PRIOR TO PLACEMENT OF FILL, A PROOF ROLL SHOULD BE PERFORMED TO IDENTIFY AREAS THAT EXHIBIT INSTABILITY AND DEFLECTION. THE DELETERIOUS SOILS IN THESE AREAS SHOULD BE REMOVED AND REPLACED WITH PROPERLY COMPACTED FILL AS MENTIONED ABOVE. PROOFROLL TESTS ARE IN ADDITION TO THE REQUIREMENT TO PLACING AND COMPACTION OF SUBGRADE FILL SOILS WITHIN THE RECOMMENDED RANGES OF MOISTURE CONTENT AND RELATIVE COMPACTION PRESENTED IN THIS REPORT.

THE SIDEWALK CONSTRUCTION SHOULD CONSIST OF CONTROL JOINTS EXTENDING TO AN EFFECTIVE DEPTH IF NECESSARY AND SPACED NO MORE THAN 10 FEET APART.

SECTIONS ARE BASED ON RECOMMENDATIONS BY "FINAL REPORT GEOTECHNICAL INVESTIGATION RFTA WEST GLENWOOD SPRINGS PARK N RIDE PAVEMENT AND RETAINING WALL RECOMMENDATIONS" BY YEH AND ASSOCIATES INC., JULY 30, 2015.

CONTRACTOR TO PREPARE A JOINTING PLAN FOR ENGINEER REVIEW AND APPROVAL MINIMUM 7 DAYS PRIOR TO PLACING ANY CONCRETE PAVEMENT.

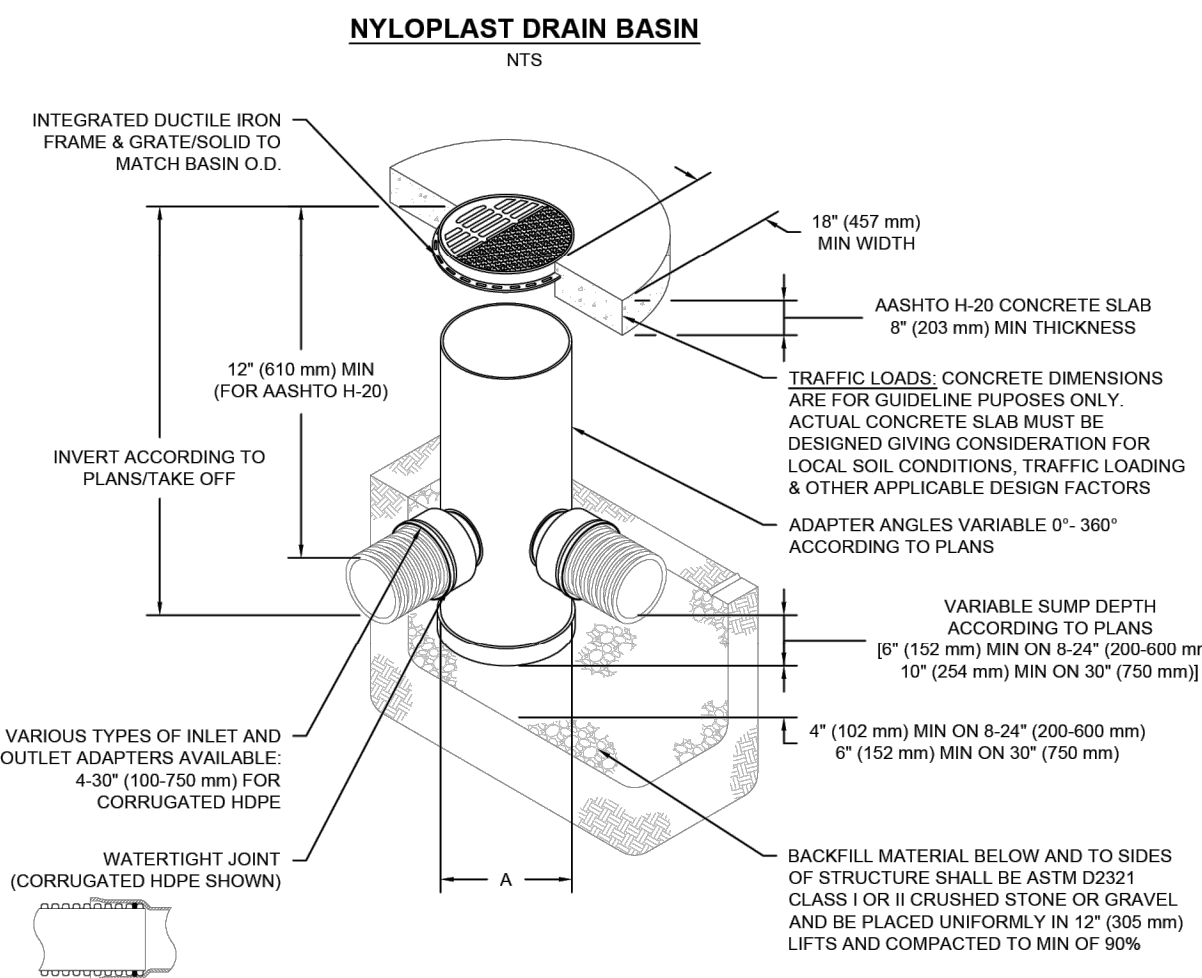
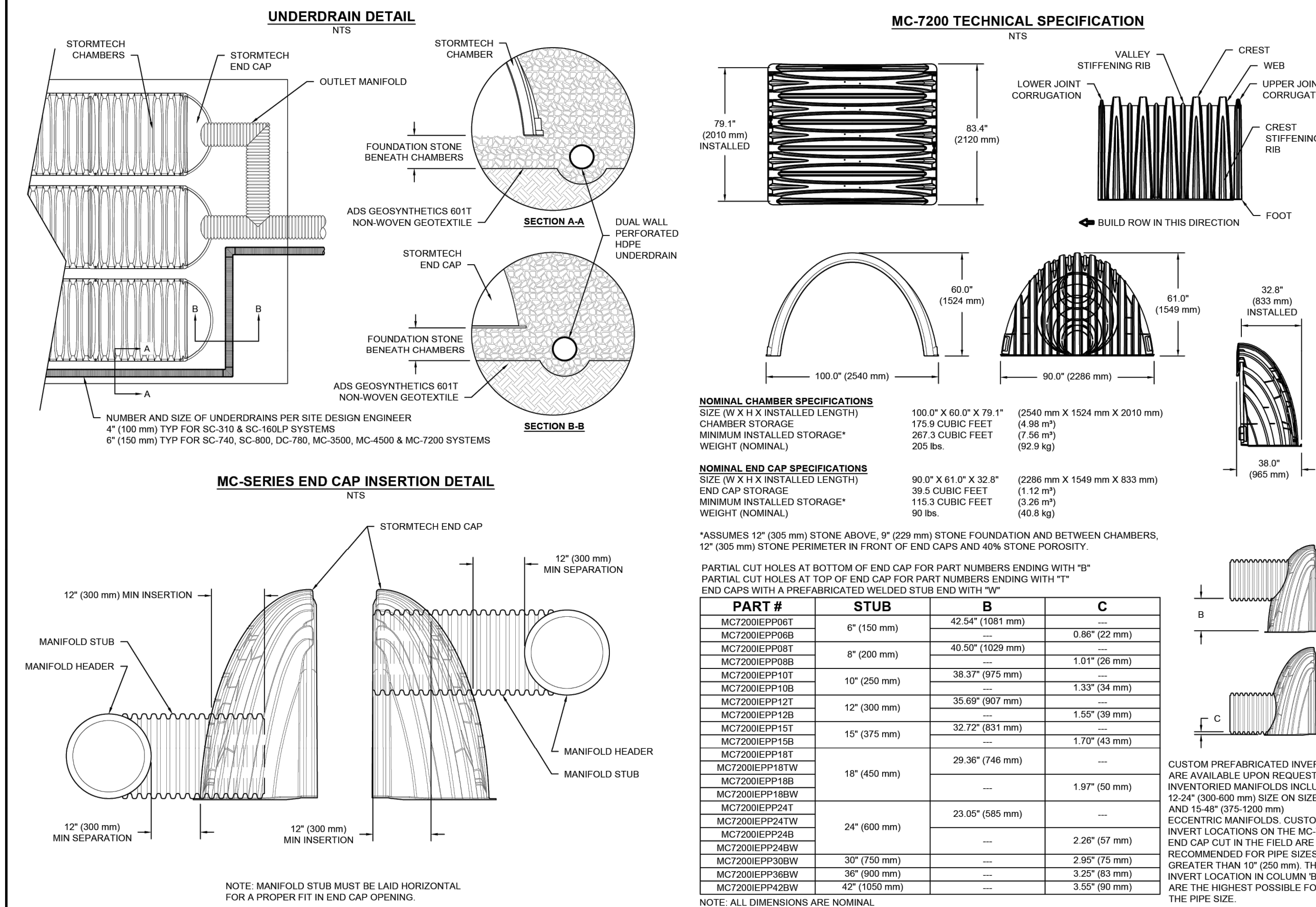
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| File Name: Civil Details.dwg                                                                                                                                                                                                                                                                  |  | Rev.                 | Date     | Comments                   | Init. |                                                                                                                                                                 |  | No Revisions: |                        |                         |              |  | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                             |  | <input type="text"/> | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:      | Designer: T. Nuetzel   | Structure Numbers       | 25924        |  |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000      Tele. (720) 540-6800<br>2000 South Colorado Boulevard      (800) 490-4966<br>Denver, CO 80222-7900      Fax (720) 540-6801 |  | <input type="text"/> |          |                            |       |                                                                                                                                                                 |  | Void:         | Detailer: B. Risk      |                         |              |  |                  |  |
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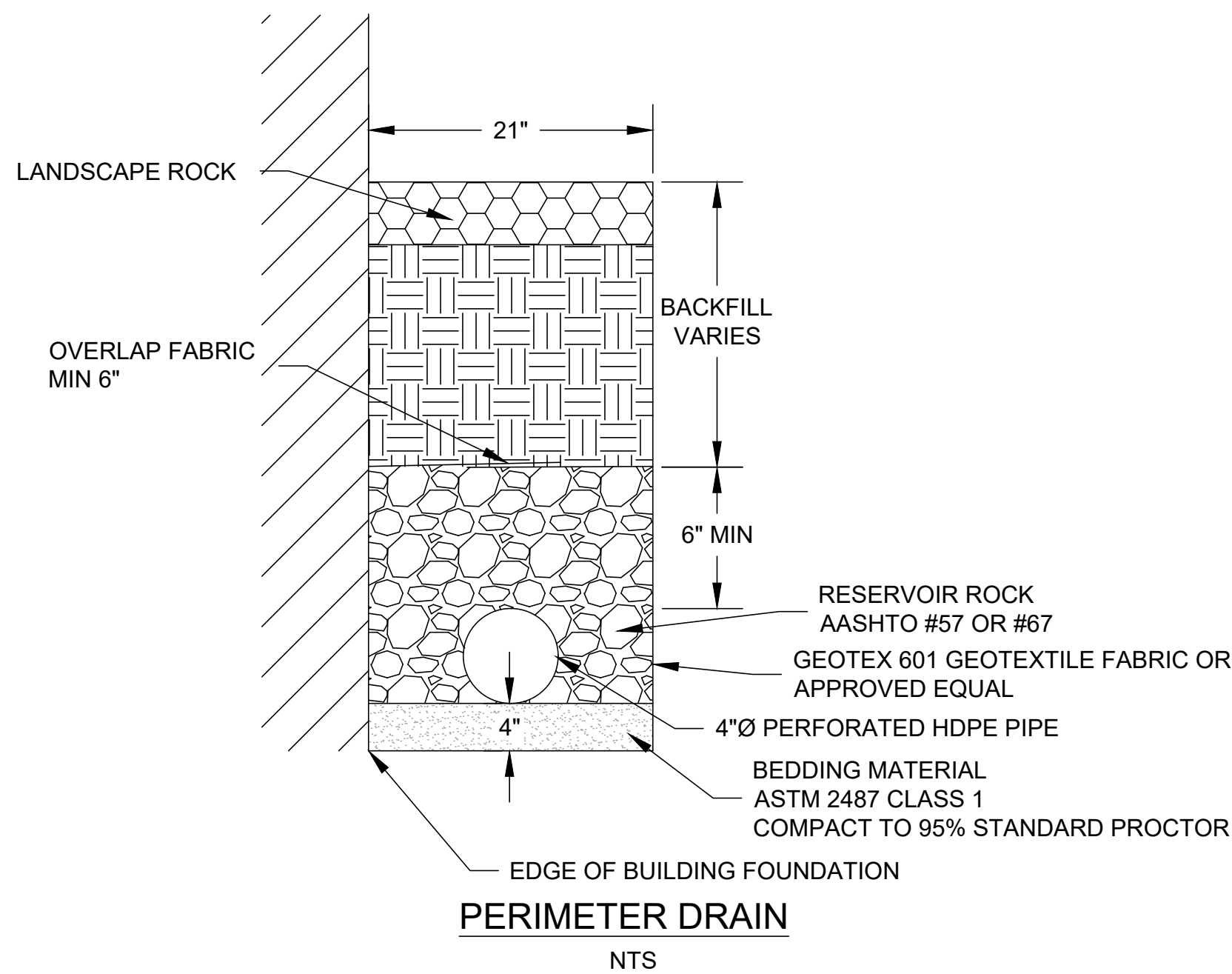






- ## NOTES
1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
  2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
  3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
  4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
  5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: [WWW.NYLOPLAST-US.COM](http://WWW.NYLOPLAST-US.COM)
  6. TO ORDER CALL: **800-821-6710**

| A               | PART # | GRATE/SOLID COVER OPTIONS        |                         |                      |  |
|-----------------|--------|----------------------------------|-------------------------|----------------------|--|
| 8"<br>(200 mm)  | 2808AG | PEDESTRIAN LIGHT<br>DUTY         | STANDARD LIGHT<br>DUTY  | SOLID LIGHT DUTY     |  |
| 10"<br>(250 mm) | 2810AG | PEDESTRIAN LIGHT<br>DUTY         | STANDARD LIGHT<br>DUTY  | SOLID LIGHT DUTY     |  |
| 12"<br>(300 mm) | 2812AG | PEDESTRIAN<br>AASHTO H-10        | STANDARD AASHTO<br>H-20 | SOLID<br>AASHTO H-20 |  |
| 15"<br>(375 mm) | 2815AG | PEDESTRIAN<br>AASHTO H-10 + H-10 | STANDARD AASHTO<br>H-20 | SOLID<br>AASHTO H-20 |  |
| 18"<br>(450 mm) | 2818AG | PEDESTRIAN<br>AASHTO H-10        | STANDARD AASHTO<br>H-20 | SOLID<br>AASHTO H-20 |  |
| 24"<br>(600 mm) | 2824AG | PEDESTRIAN<br>AASHTO H-10        | STANDARD AASHTO<br>H-20 | SOLID<br>AASHTO H-20 |  |
| 30"<br>(750 mm) | 2830AG | PEDESTRIAN<br>AASHTO H-10        | STANDARD AASHTO<br>H-20 | SOLID<br>AASHTO H-20 |  |

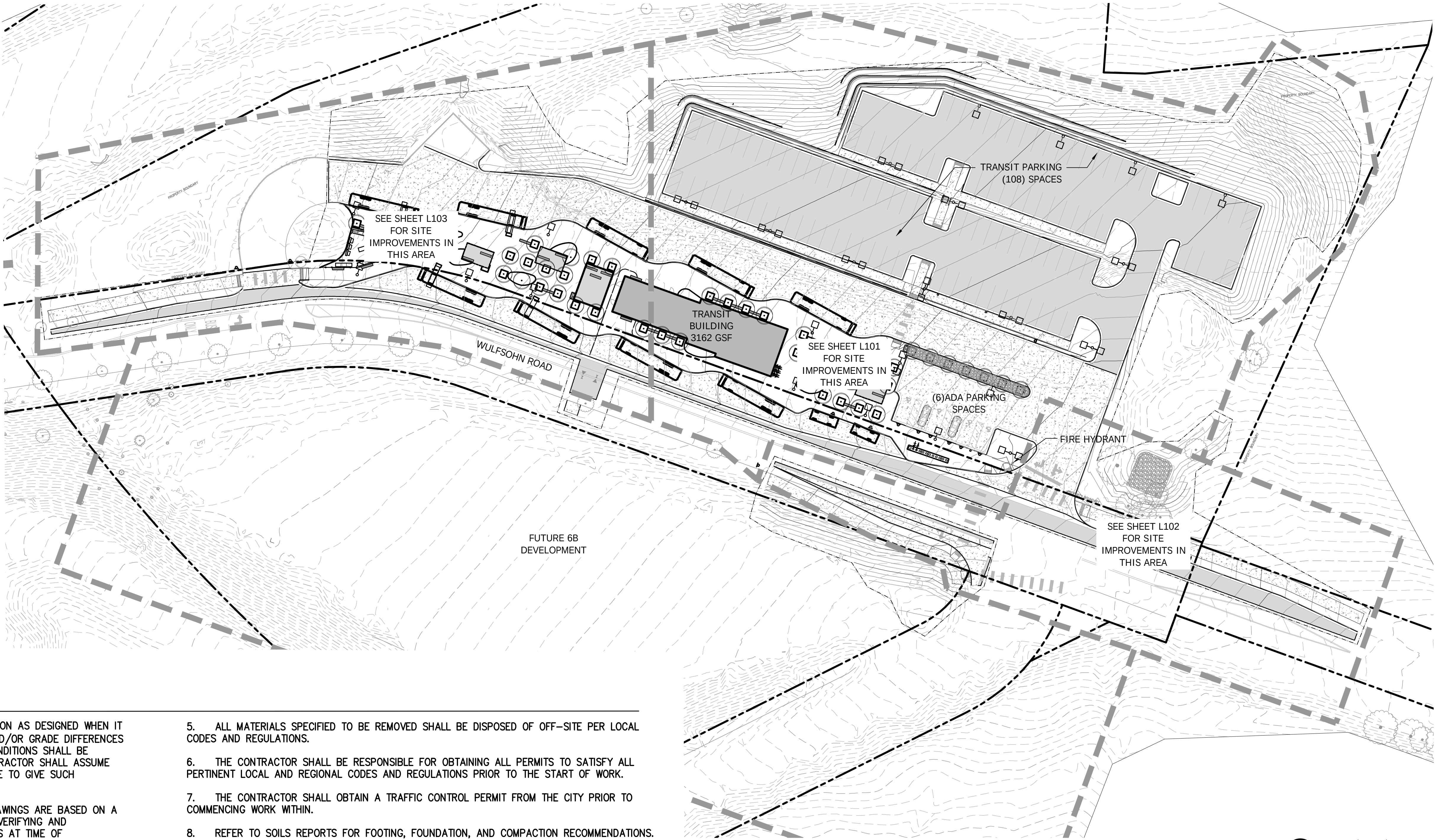


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| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                           |  | <div></div>     | 09/17/24 | 50% CONSTRUCTION DOCUMENTS | TN/BR |                                                                                                                                                                 |  | Revised:          |  | Designer: T. Nuetzel    | Structure |              | 25924 |                  |  |
| <div><div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>     |          |                            |       |                                                                                                                                                                 |  | Detailer: B. Risk |  | Numbers                 |           | Sheet Number |       |                  |  |
|                                                                                                                                                                                                                                             |  | <div></div>     |          |                            |       |                                                                                                                                                                 |  | Sheet Subset:     |  | Subset Sheets: C1005 of |           |              |       |                  |  |
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LEGEND

- PROPERTY BOUNDARY
- SHEET MATCHLINE
- EXISTING CONTOURS
- EXISTING TREES TO REMAIN
- PROPOSED SITE WALLS ( SEE CIVIL & STRUCTURAL DWGS.
- PROPOSED BACKLESS BENCH
- PROPOSED TREE GRATE W/ TREE PROTECTION & STRUCTURAL SOIL
- PROPOSED BUS CHARGING STATION (SEE MEP)
- PROPOSED SCREENING FENCE
- PROPOSED SHADE STRUCTURE
- PROPOSED RAISED PLANTER
- PROPOSED SITE LIGHTING (SEE LIGHTING PLANS)
- PROPOSED BEAR-PROOF TRASH AND RECYCLING RECEPTACLE
- PROPOSED BIKE SHARE STATION (SEE CIVIL AND WECYCLE)
- PROPOSED BIKE RACK
- PROPOSED ASPHALT PAVING; SEE CIVIL
- PROPOSED CONCRETE VEHICULAR PAVING; SEE CIVIL
- PROPOSED CONCRETE PEDESTRIAN PAVING; SEE CIVIL
- NOTE: SEE INDIVIDUAL PLAN ENLARGEMENTS FOR MATERIAL & FURNISHINGS CALL-OUTS, AND DETAIL REFERENCES.



GENERAL NOTES

1. CONTRACTOR SHALL NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS, AREA DISCREPANCIES AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATIONS.

2. EXISTING UTILITY ALIGNMENTS AND GRADES SHOWN ON THE DRAWINGS ARE BASED ON A FIELD SURVEY. THE CONTRACTOR SHALL STILL BE RESPONSIBLE FOR VERIFYING AND DETERMINING EXACT LOCATIONS, DIMENSIONS, DEPTHS, AND MATERIALS AT TIME OF CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES FAR ENOUGH IN ADVANCE OF NEW CONSTRUCTION TO ALLOW FOR POSSIBLE GRADE, DEPTH, ALIGNMENT, OR MATERIAL CHANGES. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES DURING ALL DEMOLITION AND CONSTRUCTION OPERATIONS. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR COSTS INCURRED DUE TO DAMAGE AND REPLACEMENT OF SAID UTILITIES.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH ALL CONSTRUCTION OPERATIONS. ALL PIPING, CONDUIT, SLEEVES, ETC., SHALL BE SET IN PLACE PRIOR TO INSTALLATION OF CONSTRUCTION ITEMS.

4. ALL EXISTING IMPROVEMENTS TO REMAIN SHALL BE PROPERLY AND ADEQUATELY PROTECTED FROM DAMAGE DURING CONSTRUCTION AND DEMOLITION OPERATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RESTORE TO THE ORIGINAL CONDITION ANY EXISTING ITEMS THAT ARE DAMAGED OR DISTURBED IN ANY WAY. ALL MATERIALS TO BE REUSED OR SALVAGED SHALL BE STORED IN AN AREA DESIGNATED BY THE OWNER FOR THAT PURPOSE. ALL SALVAGED MATERIALS SHALL REMAIN THE PROPERTY OF THE OWNER.
5. ALL MATERIALS SPECIFIED TO BE REMOVED SHALL BE DISPOSED OF OFF-SITE PER LOCAL CODES AND REGULATIONS.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS TO SATISFY ALL PERTINENT LOCAL AND REGIONAL CODES AND REGULATIONS PRIOR TO THE START OF WORK.

7. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT FROM THE CITY PRIOR TO COMMENCING WORK WITHIN.

8. REFER TO SOILS REPORTS FOR FOOTING, FOUNDATION, AND COMPACTION RECOMMENDATIONS.

9. PRESERVE AND PROTECT ALL EXISTING TREES ON SITE, UNLESS NOTED AS A REMOVAL.

10. ALL DEMOLITION MUST BE COORDINATED WITH THE OWNER, THE CIVIL ENGINEER, AND BE FIELD VERIFIED.

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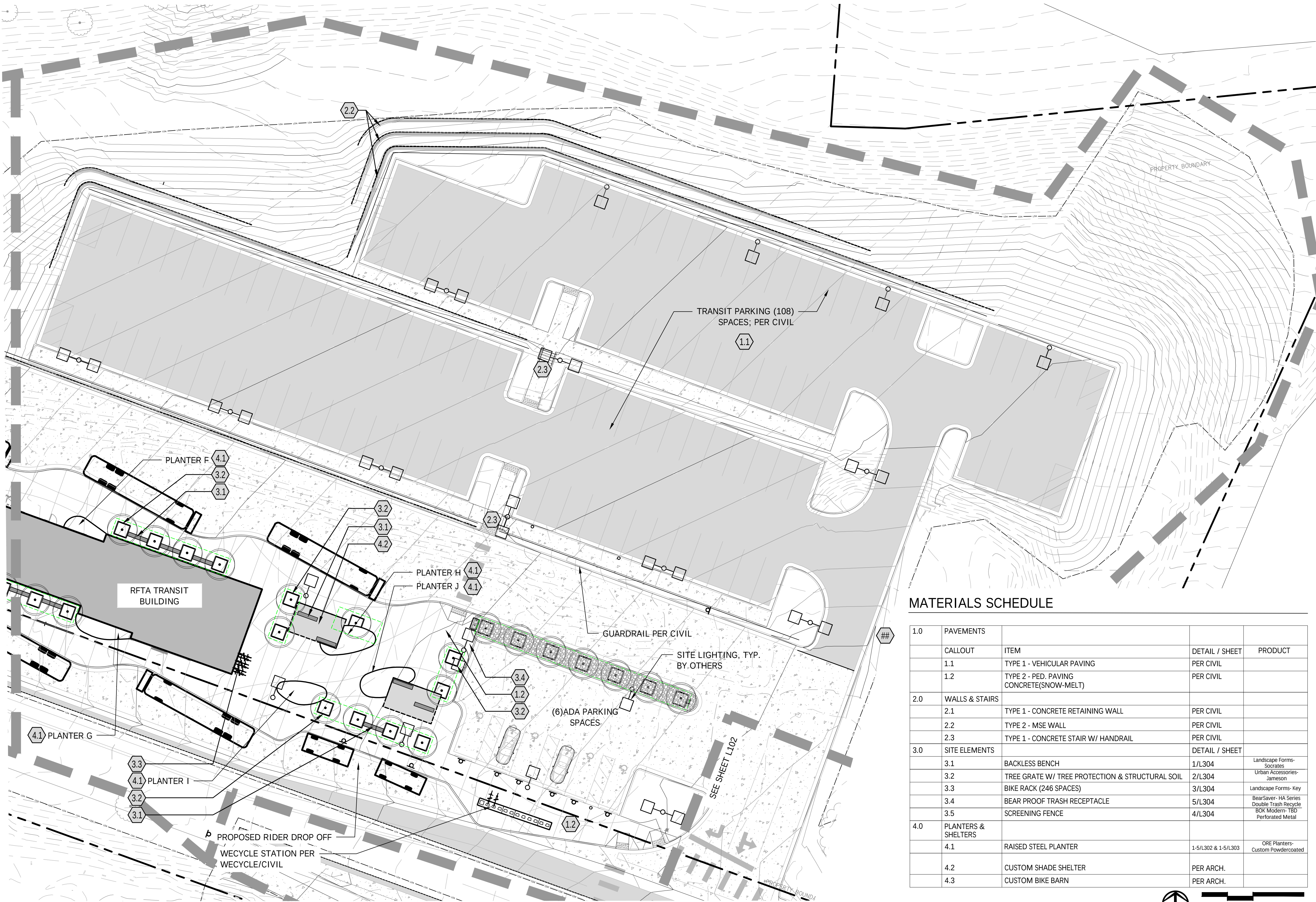
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| Print Date: 9/17/2024 2:57 PM                                                                                                                                                                                                                     |  | Sheet Revisions |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br>WEST GLENWOOD TRANSIT CENTER |  | FIR Plans     |  | SITE PLAN 6A  |    |                |    | Project No./Code         |  |
| File Name: 0-23019-SITE-PLAN_TRANSIT.dwg                                                                                                                                                                                                          |  | Rev.            | Date     | Comments | Init. |                                                                       |  | No Revisions: |  | TRG M535-014  |    |                |    |                          |  |
| Horiz. Scale: As Noted Vert. Scale: As Noted                                                                                                                                                                                                      |  | <div></div>     | 09/17/24 | 50% CD   | LW/SH | 2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601                      |  | Revised:      |  | Designer:     | LW | Structure      |    | 25924                    |  |
| <div><div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>     |          |          |       |                                                                       |  | Void:         |  | Detailer:     | SH | Numbers        |    |                          |  |
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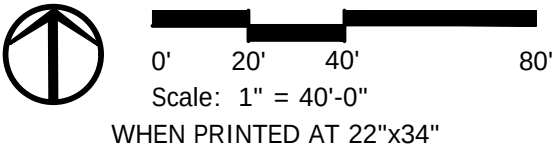
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NOTES:  
1.SEE CIVIL PLANS FOR ALL GRADING & DRAINAGE.  
2.PAVEMENT MARKINGS & ADA CURB RAMPS PER CIVIL.



MATERIALS SCHEDULE

| 1.0 | PAVEMENTS           |                                                 |                     |                                                                            |
|-----|---------------------|-------------------------------------------------|---------------------|----------------------------------------------------------------------------|
|     | CALLOUT             | ITEM                                            | DETAIL / SHEET      | PRODUCT                                                                    |
| 1.1 |                     | TYPE 1 - VEHICULAR PAVING                       | PER CIVIL           |                                                                            |
| 1.2 |                     | TYPE 2 - PED. PAVING CONCRETE(SNOW-MELT)        | PER CIVIL           |                                                                            |
| 2.0 | WALLS & STAIRS      |                                                 |                     |                                                                            |
| 2.1 |                     | TYPE 1 - CONCRETE RETAINING WALL                | PER CIVIL           |                                                                            |
| 2.2 |                     | TYPE 2 - MSE WALL                               | PER CIVIL           |                                                                            |
| 2.3 |                     | TYPE 1 - CONCRETE STAIR W/ HANDRAIL             | PER CIVIL           |                                                                            |
| 3.0 | SITE ELEMENTS       |                                                 | DETAIL / SHEET      |                                                                            |
| 3.1 |                     | BACKLESS BENCH                                  | 1/L304              | Landscape Forms- Socrates                                                  |
| 3.2 |                     | TREE GRATE W/ TREE PROTECTION & STRUCTURAL SOIL | 2/L304              | Urban Accessories- Jameson                                                 |
| 3.3 |                     | BIKE RACK (246 SPACES)                          | 3/L304              | Landscape Forms- Key                                                       |
| 3.4 |                     | BEAR PROOF TRASH RECEPTACLE                     | 5/L304              | BearSaver- HA Series Double Trash-Recycle BOX Modern- TBD Perforated Metal |
| 3.5 |                     | SCREENING FENCE                                 | 4/L304              |                                                                            |
| 4.0 | PLANTERS & SHELTERS |                                                 |                     |                                                                            |
| 4.1 |                     | RAISED STEEL PLANTER                            | 1-5/L302 & 1-5/L303 | ORE Planters- Custom Powdercoated                                          |
| 4.2 |                     | CUSTOM SHADE SHELTER                            | PER ARCH.           |                                                                            |
| 4.3 |                     | CUSTOM BIKE BARN                                | PER ARCH.           |                                                                            |



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Vert. Scale: As Noted

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Fax (720) 540-6801

| Sheet Revisions |          |          |       |  |
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ROARING FORK TRANSPORTATION AUTHORITY

WEST GLENWOOD TRANSIT CENTER

2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     |
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| No Revisions: |
| Revised:      |
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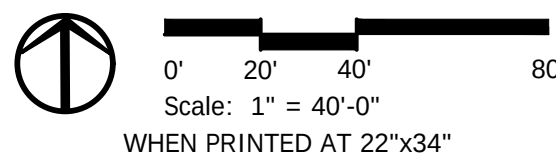
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|---------------|----|----------------|----|
| Designer:     | LW | Structure      |    |
| Detailer:     | SH | Numbers        |    |
| Sheet Subset: |    | Subset Sheets: | of |

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| TRG M535-014     |      |
| 25924            |      |
| Sheet Number     | L101 |



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|-------------------------------------------------------------------------------------|----------------------------------------------------------|
|    | BOUNDARY                                                 |
|    | SHEET MATCHLINE                                          |
|    | EXISTING CONTOURS                                        |
|    | EXISTING TREES TO REMAIN                                 |
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|    | PROPOSED BIKE RACK                                       |
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## MATERIALS SCHEDULE

Packet Page 488



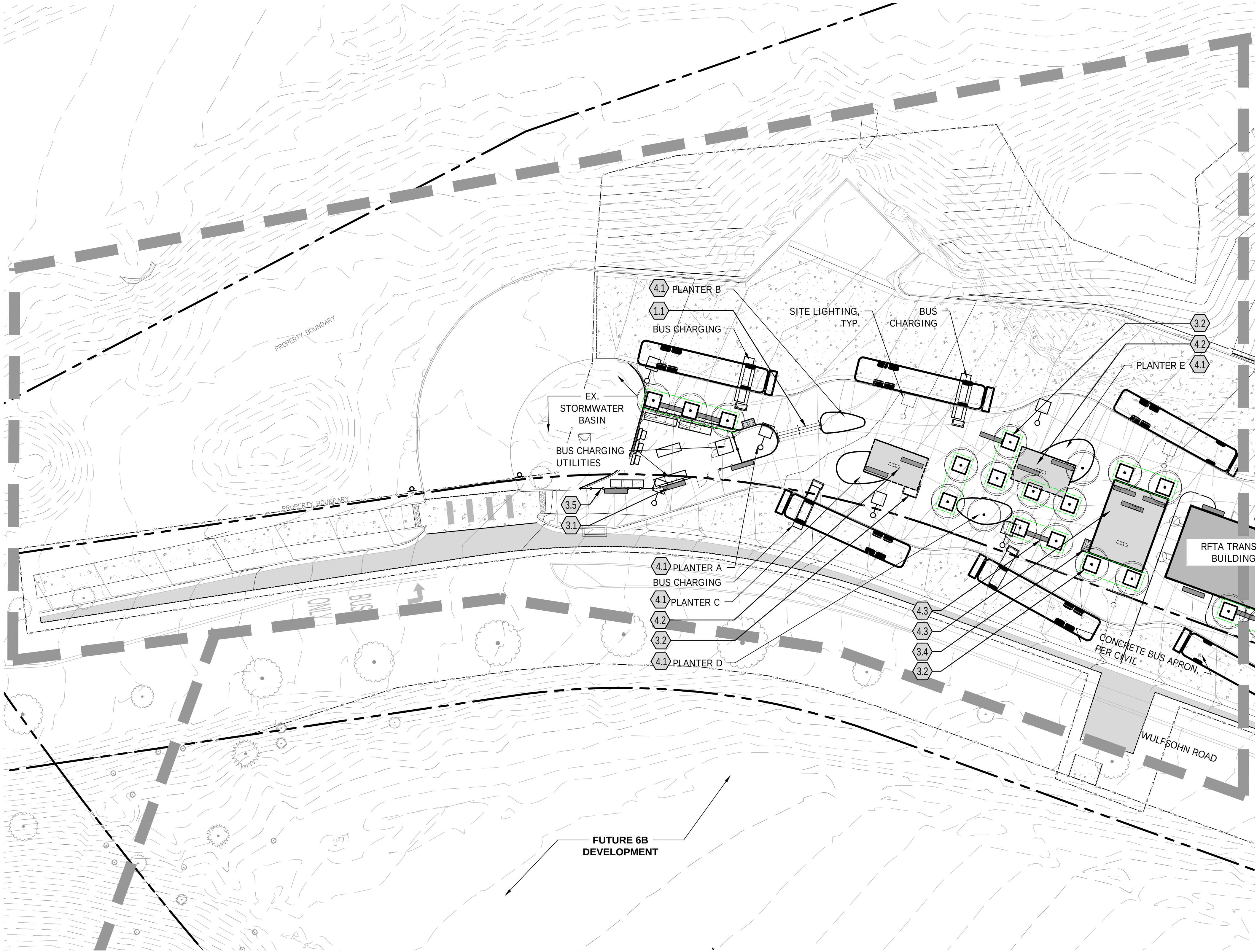
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|     | 4.1                 | RAISED STEEL PLANTER                            | 1-5/L302 & 1-5/L303 | ORE Planters- Custom Powdercoated                                         |
|     | 4.2                 | CUSTOM SHADE SHELTER                            | PER ARCH.           |                                                                           |
|     | 4.3                 | CUSTOM BIKE BARN                                | PER ARCH.           |                                                                           |





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PLANTING NOTES

1.

CONTRACTOR TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO BEFORE DIGGING, INCLUDING BUT NOT LIMITED TO, TRENCHING AND SHRUB AND TREE PLANTING PITS. IF UTILITIES OCCUR AT LOCATIONS OF PROPOSED SHRUBS, OR WITHIN EIGHT (8) FEET OF PROPOSED TREES, THE CONTRACTOR SHALL REPORT SUCH CONDITIONS TO THE OWNER'S REPRESENTATIVE. DAMAGE TO EXISTING UTILITIES BY THE LANDSCAPE CONTRACTOR IS THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR.
2.

THE LANDSCAPE PLAN AND DETAILS ARE TO BE USED IN CONJUNCTION WITH THE CIVIL AND ARCHITECTURAL PLANS TO FORM COMPLETE INFORMATION REGARDING SITE WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH ALL CONSTRUCTION OPERATIONS. ALL PIPING, CONDUIT, SLEEVES, ETC., SHALL BE SET IN PLACE PRIOR TO INSTALLATION OF CONSTRUCTION ITEMS.
3.

ALL EXISTING IMPROVEMENTS TO REMAIN, INCLUDING BUT NOT LIMITED TO UTILITIES, CURB AND GUTTER, WALKWAYS, EXISTING IRRIGATION , AND EXISTING STRUCTURES, SHALL BE PROPERLY AND ADEQUATELY PROTECTED FROM DAMAGE DURING CONSTRUCTION OPERATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RESTORE TO THE ORIGINAL CONDITION ANY EXISTING ITEMS THAT ARE DAMAGED OR DISTURBED IN ANY WAY, AND AT NO ADDITIONAL COST TO THE OWNER.
4.

TO THE MAXIMUM EXTENT POSSIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE STOCKPILED ON-SITE FOR LATER USE ON AREAS REQUIRING REVEGETATION AND LANDSCAPING.
6.

DURING ROUGH CLEARING AND GRUBBING, AND ESTABLISHMENT OF ROUGH GRADE, EARTHMOVING CONTRACTOR TO REMOVE ROOTS, STUMPS, LARGE BOULDERS, ORGANIC MATERIAL, AND OTHER DELETERIOUS MATERIAL PER THE CIVIL REQUIREMENTS FOR MASS EXCAVATION AND ROUGH GRADING.
7.

PRIOR TO PLACING OF TOPSOIL OR SOIL AMENDMENTS, CONTRACTOR TO REMOVE SURFACE STONES AND PREPARE SUBGRADE AS FOLLOWS:

a.

NATIVE SEED AREAS: BOULDERS AND ROCKS RETAINED BY A 4" SCREEN

b.

IN-GROUND PLANTING BED AREAS: SCARIFY NATIVE SOIL TO A DEPTH OF 18" BELOW FINISHED GRADE; REMOVE STONES LARGER THAN 6" (IN ANY DIMENSION); ADDITIONALLY REMOVE A VOLUME OF NATIVE SOIL SUFFICIENT TO ALLOW FOR ADDITION OF COMPOST AMENDMENT AS DESCRIBED BELOW. REMOVE ROCKS LARGER THAN 1" FROM THE TOP 6" OF NATIVE SOIL PRIOR TO AMENDING WITH COMPOST.

c.

ALL PLANTED AREAS IMPACTED BY UTILITY INSTALLATION, PAVING SUBGRADE, OR VEHICLE TRACKING: REMOVE GRAVELS AND SCARIFY SOILS TO CREATE A PLANTING LENS OF SOIL NO LESS THAN 6". SCARIFICATION AND PLANTING SOIL MAY BE DEEPER FOR SPECIFIC AREAS AS IDENTIFIED ON THE LANDSCAPE PLANS.

d.

TREE PLANTING TRENCH AT STRUCTURAL SOILS: EXCAVATE AND REMOVE NATIVE SOILS TO THE DEPTHS INDICATED IN THE PLANS AND DETAILS TO ALLOW FOR THE SPECIFIED VOLUMES OF STRUCTURAL SOIL AND PLANTING SOIL.

d.

IN NO CIRCUMSTANCE SHALL CONTRACTOR EXCAVATE SUBSOILS IN A MANNER THAT WILL UNDERMINE STRUCTURAL SUBGRADE, FOOTINGS, PAVING, UTILITIES, OR VIOLATE SPECIFICATIONS FOR RETAINING WALLS OR THE RECOMMENDATIONS OF THE GEOTECHNICAL SOILS STUDY.
8.

CONTRACTOR SHALL FOLLOW THE LANDSCAPE PLAN. ANY DISCREPANCIES BETWEEN THE PLAN AND FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER'S AUTHORIZED REPRESENTATIVE BEFORE PROCEEDING WITH WORK.
9.

CONTRACTOR SHALL USE LOCAL BEST MANAGEMENT PRACTICES FOR OBTAINING AND INSTALLING LANDSCAPE MATERIALS. COMPLETE THE WORK USING SKILLED PERSONNEL, PROFICIENT IN THE TRADES REQUIRED & IN A NEAT , ORDERLY AND RESPONSIBLE MANNER & WITH RECOGNIZED STANDARDS OF WORKMANSHIP.
10.

ALL PLANTS TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. NOTIFY OWNER FOR INSPECTION AND APPROVAL OF PLANT MATERIAL AT TIME OF DELIVERY. TREES ARE TO BE TAGGED AT THE NURSERY BY OWNER'S REPRESENTATIVE. ANY PLANT NOT MEETING OWNER'S APPROVAL MAY BE REJECTED AT ANY TIME PRIOR TO FINAL ACCEPTANCE.
11.

PLANT MATERIAL MUST MEET CURRENT LANDSCAPE NURSERY STANDARDS &/OR ANSI Z60.1.
12.

IF PLANTS ARE NOT AVAILABLE, NOTIFY OWNER FOR APPROVAL OF CHANGE BEFORE MAKING SUBSTITUTIONS, INCLUDING SUB-SPECIES OR VARIETIES OF SPECIFIED PLANT.
13.

THE OWNER'S AUTHORIZED REPRESENTATIVE MUST APPROVE ALL PLANTING LAYOUTS PRIOR TO PLANTING. ALL ADJUSTMENTS SHALL BE MADE BY THE CONTRACTOR PRIOR TO INSTALLING PLANTS. THE CONTRACTOR SHALL NOT DIG PLANT PITS UNTIL LOCATIONS ARE APPROVED.
14.

MINOR FIELD ADJUSTMENTS TO THE PLANTING PLANS MAY BE NECESSARY BASED ON THE ACTUAL LOCATION OF LIGHTS, TRANSFORMERS, GROUND-MOUNTED CABINETS, UTILITY PEDESTALS, AND SIMILAR FEATURES. CONTRACTOR MUST OBTAIN APPROVAL FROM THE OWNER PRIOR TO ADJUSTING THE DESIGN.
15.

IF THERE IS A DISCREPANCY BETWEEN THE PLANT COUNTS ON THE CALL-OUTS ON THE PLANS & THE ACTUAL NUMBER OF PLANT SYMBOLS DEPICTED ON THE PLANS, THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING THE ACTUAL NUMBER OF PLANTS AS SYMBOLICALLY DEPICTED ON THE PLANS.
16.

ALL SHRUB BEDS AND SOD AREAS, IF ANY, SHALL BE CONTAINED BY A STEEL EDGER, OR A CONCRETE CURB, WALK, OR OTHER SHRUB BED DEFINING ELEMENT - AS PER PLANS AND SPECIFICATIONS.
17.

SOD AREAS SHALL RECEIVE A MINIMUM OF 5 CU. YDS PER 1000 S.F. OF A-1 ORGANIC'S BIOCOMP, OR A WELL DECOMPOSED COMPOST APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE. SHRUB BEDS SHALL RECEIVE A MINIMUM OF 4 CU. YDS. PER 1000 S.F. OF ONE OF THE ABOVE MATERIALS. ALL AMENDMENTS SHALL BE THOROUGHLY TILLED A MIN. OF 6" INTO THE SOIL.
18.

SEEDED AREAS ARE TO RECEIVE AN AMENDMENT OF TRITON RICHLAWN OR APPROVED EQUAL. SOIL AMENDMENTS ARE TO BE APPLIED AT MANUFACTURER'S RECOMMENDED RATES AND IN THE SEQUENCE IDENTIFIED IN THESE NOTES.
19.

IN-GROUND SHRUB BEDS ARE TO RECEIVE A MINIMUM OF 4 CUBIC YARDS OF COMPOST PER 1,000 SQUARE FEET OF BED AREA, TILLED INTO THE TOP 6" OF NATIVE SOILS FOLLOWING SUBSOIL PREPARATION AS IDENTIFIED ABOVE.
20.

PLANTING BEDS, SHRUB PITS, TREE PITS ARE TO BE EXCAVATED PER THE PLANTING DETAILS. PLANTING PIT BACKFILL (AKA PLANTER MIX, AKA PLANTING SOIL) IS TO BE: 1 PART COMPOST TO 3 PARTS TOPSOIL PROVIDED BY A LOCAL TOPSOIL PROCESSING FACILITY. CONTRACTOR TO PROVIDE NUTRIENT ANALYSIS FOR PLANTING PIT BACKFILL FOR APPROVAL.
21.

ALL LANDSCAPE AREAS WILL BE IRRIGATED WITH A FULLY AUTOMATIC UNDERGROUND IRRIGATION SYSTEM.
22.

IRRIGATION SLEEVING SHALL BE INSTALLED PRIOR TO INSTALLING CONCRETE FLATWORK
23.

MULCH - ALL PLANTING BEDS SHALL BE COVERED BY SOIL PEP MULCH (OR ACCEPTED SUBSTITUTION) AS APPROVED BY OWNER. ALSO REFER TO SPECIFICATIONS AND DETAILS.

23.1.

ALL SHRUB BEDS SHALL RECEIVE A MINIMUM OF 4" OF MULCH

23.1.1.

EXCEPT GROUNDCOVERS SHALL RECEIVE 3" OF MULCH.

23.1.2.

DO NOT BURY PERENNIALS OR ORNAMENTAL GRASSES WITH MULCH.

23.1.3.

MULCH RINGS AROUND SHRUBS IN NATIVE AREAS SHALL BE A MINIMUM OF 2'.

23.1.4.

MULCH RINGS AT TREES SHALL BE 4" DEEP IN NON-TURF AREAS & 2" DEEP IN TURF AREAS.

23.1.1.

PULL MULCH BACK 4-6" FROM TRUNK OF TREES AS PER DETAILS.

23.1.2.

DO NOT PROVIDE A WATER BASIN FOR TREES IN LAWN AREAS
24.

SPACING / LAYOUT

24.1.

TREES TO BE CENTERED IN LANDSCAPE STRIPS OR TREE LAWNS UNLESS OTHERWISE NOTED. ALL OTHER TREES TO BE A MINIMUM OF 6' FROM HARDSCAPE.

24.2.

TREES TO BE A MINIMUM OF 8' FROM CENTER LINE OF UNDERGROUND UTILITIES SUCH AS STORM SEWERS, WATER MAINS, ETC.

24.3.

ALL EVERGREEN TREES SHALL BE A MINIMUM OF 12' FROM TRAILS, OR WALKS. EDGING SHALL BE MINIMUM OF 8' FROM EVERGREEN TREES.

24.4.

LARGE SHRUBS (THOSE OVER 6' SPACING AS SHOWN IN THE PLANT SCHEDULE) SHALL BE PLANTED A MINIMUM OF 5' FROM EDGER OR WALKS.

24.5.

SMALLER SHRUBS (THOSE LESS THAN 6' SPACING AS SHOWN IN THE PLANT SCHEDULE) SHALL BE PLANTED A MINIMUM OF 3' FROM EDGER OR WALKS.
25.

ALL LANDSCAPE EDGING SHALL BE INSTALLED CAREFULLY SO AS TO NOT IMPACT THE ROOTS OF EXISTING TREES.

SEEDING NOTES:

BROADCAST SEEDING

1.

SITE PREPARATION

1.1.

PREPARE AND PLAN - LIMIT SITE PREPARATION TO THOSE AREAS THAT WILL BE PLANTED WITHIN 24-48 HOURS AND WILL NOT BE ADVERSELY EFFECTED BY PREDICTED WEATHER PATTERNS. SEED IMMEDIATELY AFTER PREPARATION OF SOILS BETWEEN THE APPROVED SEEDING TIMES.

1.2.

SEED DURING OPTIMAL GERMINATION TIMES - SEEDING EFFORTS SHOULD OCCUR WHEN SOIL MOISTURE AND TEMPERATURE ARE OPTIMUM FOR GERMINATION:

1.3.

SPRING – APPLY SEED FOLLOWING THE SPRING SNOW MELT FROM LATE APRIL TO THE BEGINNING OF MAY.

1.4.

LATE FALL – DORMANT SEEDING PRIOR TO THE FIRST PERENNIAL SNOW FALL, FROM MID-OCTOBER TO EARLY NOVEMBER.

1.5.

REMOVE DEBRIS AND VEGETATION - STONES LARGER THAN 5-INCHES IN SIZE, TRASH, DEBRIS, TWIGS, STEMS, ROOT MAT, AND OTHER MATTER DETRIMENTAL TO VEGETATION GROWTH SHALL BE REMOVED

1.6.

LOOSEN AND TEXTURIZE TOPSOIL - THE SITE SHOULD BE PREPARED BY LOOSENING THE TOPSOIL TO A MINIMUM DEPTH OF TWO (2) INCHES, THE SOIL SHOULD BE TEXTURIZED PARALLEL TO THE CONTOUR OF THE PLANTING BED TO CREATE A ROUGHENED SURFACE. THIS CAN BE ACCOMPLISHED BY DISKING, CHAIN DRAGGING, TRACKED IMPLEMENTS OR USE OF HAND RAKES. FOR SMALLER, PATCHWORK AREAS THAT ARE TO BE BROADCAST SEEDED, HAND RAKES ARE RECOMMENDED. IT IS CRITICAL THAT THE SEEDBED BE LOOSENEED TO A POINT THAT THERE ARE SPACES FOR SEED TO FILTER INTO CRACKS AND CREVICES AND DOES NOT JUST SIT ON THE SURFACE OF THE SOIL.
2.

SEED INSTALLATON

2.1.

USE SEED THAT IS IN GOOD CONDITION - DO NOT USE WET SEED OR SEED THAT IS MOLDY OR OTHERWISE DAMAGED IN TRANSIT OR STORAGE. DELIVER SEED TO JOB SITE IN THE ORIGINAL UNOPENED CONTAINERS.

2.2.

SEED DURING OPTIMAL CONDITIONS - SEEDING OPERATIONS SHOULD BE PERFORMED ONLY DURING PERIODS WHEN BENEFICIAL RESULTS CAN BE OBTAINED. DO NOT SEED DURING HIGH WINDS OR WHEN THE GROUND IS FROZEN OR OTHERWISE UNABLE TO BE WORKED. AVOID SEEDING DURING TIMES OF DROUGHT OR EXCESSIVE MOISTURE EVENTS.

2.3.

CHECK THE SEEDING RATE - BROADCAST SEEDING RATES SHOULD BE DOUBLE THE SEEDING RATE FOR DRILL SEEDING.

2.4.

EVENLY APPLY SEED – SOW SEED IN AN EVEN AND MEASURED WAY SO THAT APPLICATION ACROSS THE SITE IS UNIFORM AND EVEN.

2.5.

APPLY TWICE - THE SEEDING SHALL BE DONE IN TWO (2) SEPARATE APPLICATIONS CROSSING THE AREA AT RIGHT ANGLES TO ONE ANOTHER TO GUARANTEE EVEN COVERAGE.

2.6.

RAKE - BROADCAST SEEDING SHALL BE RAKED INTO THE SOIL TO A DEPTH OF APPROXIMATELY ONE-QUARTER INCH (1/4") TO ONE-HALF INCH (1/2").
3.

MULCHING

3.1.

ONLY SEED AS MUCH AS YOU CAN MULCH – DO NOT SEED MORE IN ONE DAY THAN YOU CAN MULCH IN THAT SAME DAY. SEEDED AREAS SHOULD NOT BE LEFT EXPOSED OVERNIGHT.

3.2.

APPLY MULCH AND TACKIFIER - CERTIFIED WEED FREE STRAW AND TACKIFIER TO BE APPLIED IMMEDIATELY FOLLOWING SEEDING APPLICATION. ALTERNATIVELY, HYDROSTRAW (800) 545-1755 MAY BE APPLIED AT A RATE OF 2,500 LBS/ACRE. HYDROSTRAW MAY NOT BE SPREAD IN A SINGLE APPLICATION.

3.3.

INSTALL CERTIFIED WEED FREE STRAW COMPLETELY AND THOROUGHLY OVER ALL SEEDING AREAS IMMEDIATELY AFTER SEEDING. ADEQUATE MULCH DEPTH IS ACHIEVED WHEN STRAW MULCH COVERS SEEDING AREA WITHOUT MAJOR GAPS.

3.4.

APPLY TACKIFIER ON TOP OF WEED FREE STRAW MULCH IMMEDIATELY AFTER INSTALLING CERTIFIED WEED FREE MULCH. TACKIFIER SHOULD COMPLETELY COVER MULCH. USE APPROVED SPRAYING MACHINES.

3.5.

USE OF ORGANIC TACKIFIER: PLANTAGO OR GUAR BASE TACKIFIER APPLIED AT (150 LB/ACRE). STRICTLY COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS.

3.6.

SPREAD UNIFORMLY AT A MINIMUM RATE OF 2 TONS PER ACRE (45 KG PER 100 SQ. M) TO FORM A CONTINUOUS BLANKET 1- ½-INCHES LOOSE DEPTH OVER SEEDED AREAS. SPREAD BY HAND, BLOWER OR OTHER SUITABLE EQUIPMENT.

3.7.

WATCH OUT FOR EROSION - PROTECT SEEDED SLOPES EXCEEDING 3:1 AGAINST EROSION WITH EROSION-CONTROL BLANKETS INSTALLED ON TOP OF SEED, MUCH AND TACKIFIER, AND STAPLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

3.8.

PROTECTION OF SEEDED AREAS - PROVIDE BARRIERS AS REQUIRED TO PREVENT PEDESTRIAN TRAFFIC OVER NEWLY SEEDED AREAS UNTIL COMPLETION AND ESTABLISHMENT OF DESIRED VEGETATION.

NATIVE SEED MAINTENANCE

1.

ESTABLISHMENT GOALS: TYPICALLY, SUCCESSFULLY ESTABLISHING NATIVE SEED REQUIRES MULTIPLE YEARS OF REGULAR MAINTENANCE. MAINTENANCE INCLUDES MECHANICAL AND CHEMICAL REMOVALS OF WEEDS, MANAGING FOR DISTURBANCE, AND IRRIGATION. ESTABLISHMENT TIMELINE BELOW. UNTIL NATIVE SEED IS ESTABLISHED, IT REQUIRES MAINTENANCE. ONCE IT IS ESTABLISHED, IT WILL REQUIRE MINIMAL MAINTENANCE.

1.1.

ESTABLISHMENT TIMELINE:

1 YEAR: 50% TOTAL VEGETATION COVER, WITH 80% NATIVE AND 20% NOXIOUS VEGETATION COVER.

2 YEAR: 70% TOTAL VEGETATION COVER, WITH 90% NATIVE AND 10% NOXIOUS VEGETATION COVER.

5 YEAR: 85% TOTAL VEGETATION COVER, WITH 90% NATIVE AND 10% NOXIOUS VEGETATION COVER.

10 YEAR: 85% TOTAL VEGETATION COVER, WITH 95% NATIVE AND 5% NOXIOUS VEGETATION COVER.

1.2.

ESTIMATES FOR SUCCESS BASED UPON PERCENT COVER.

1.3.

ANY AREA GREATER THAN 500 SQ. FT THAT HAS LESS THAN DESIRED TOTAL VEGETATION COVERAGE, WILL NEED TO BE RESEEDED. IF NOXIOUS VEGETATION EXCEEDS DESIRED PERCENTAGE, INCREASE/ALTER MANAGEMENT EFFORTS
2.

IN WILDFLOWER AREAS, ADDITIONAL WILDFLOWERS CAN BE ADDED THROUGH INNER SEEDING TO ACHIEVE THE DESIRED EFFECT. MOW DOWN ESTABLISHED NATIVE SEED PRIOR TO INNER SEEDING.
3.

ONCE THE LANDSCAPE DESIGN IS FINALIZED, DHM WILL PUT TOGETHER AN ADAPTIVE MANAGEMENT PLAN. THIS WILL INCLUDE HOW TO CONTROL FOR VARIOUS SPECIES OF NOXIOUS VEGETATION TYPICAL TO PITKIN COUNTY.

STRUCTURAL SOILS CHART

| TREE SIZE                             | CROWN PROJECTION (SQ. FT.)           | AVAILABLE WATER 8% (CU-Soil)                                                                   | AVAILABLE WATER 15% (LOAM)    |
|---------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------|
| SMALL-MEDIUM TREE, CROWN DIAMETER 20' | 314 square feet under dripline       | 440 cubic feet (16.3 cu. yards) CU-Soil with 100 cubic feet (3.5 yds) loam in tree pit opening | 330 cubic feet (12 cu. yards) |
| MEDIUM-LARGE TREE, CROWN DIAMETER 30' | 706.5 square feet under the dripline | 1225 cubic feet (45 cu. yards) CU-Soil with 100 cubic feet (3.5 yds) loam in tree pit opening  | 753 cubic feet (28 cu. yards) |

Cornell Urban Horticulture Institute Structural Soil website:  
<http://www.hort.cornell.edu/uhi/outreach/index.htm#soil>

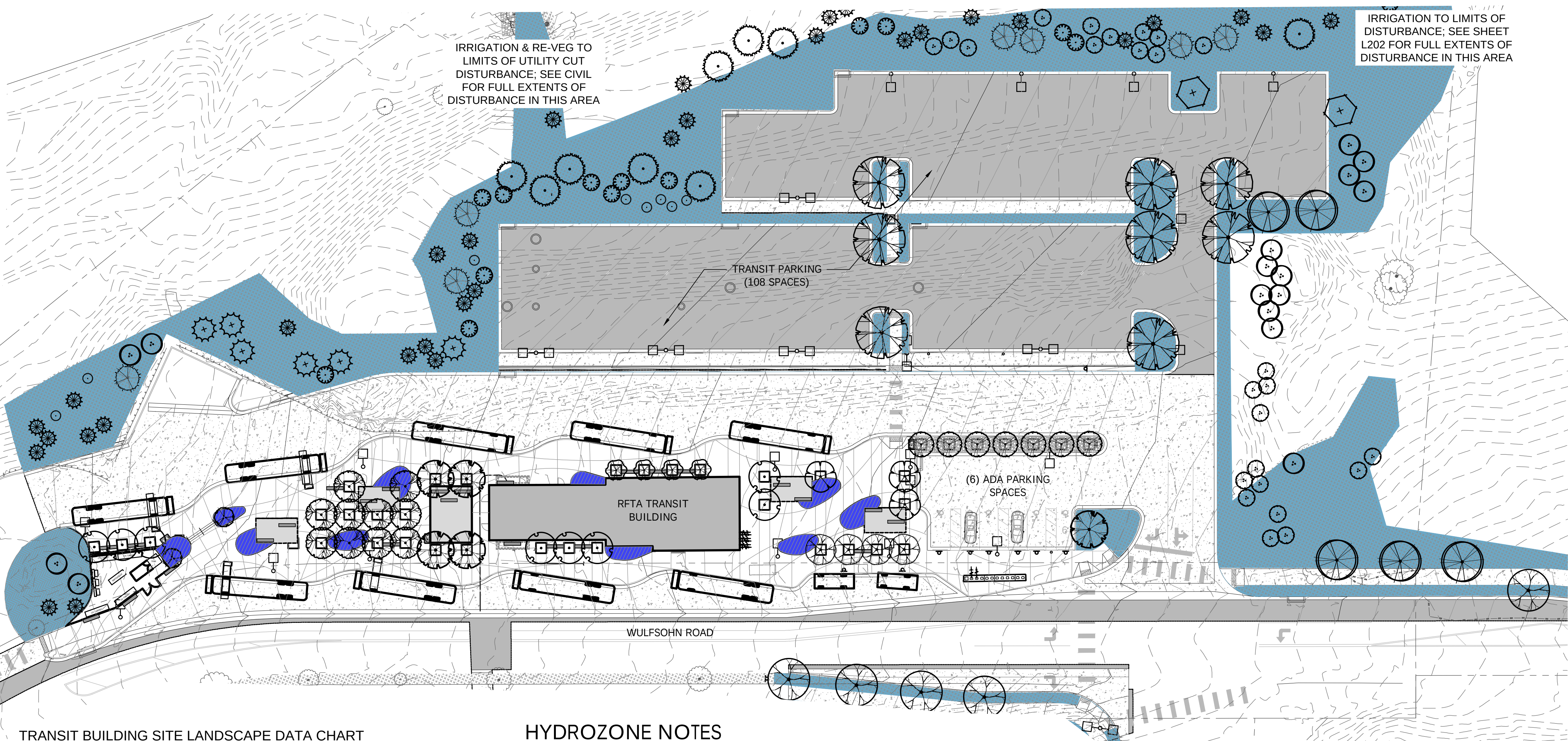
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| Print Date: 9/17/2024 3:00 PM                                                                                                                                                                                                                                              |  | Sheet Revisions |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY            |  | FIR Plans     |  | PLANTING NOTES |    |                | Project No./Code |                   |
| File Name: 0-23019-PLANTING_TRANSIT.dwg                                                                                                                                                                                                                                    |  | Rev.            | Date     | Comments | Init. | WEST GLENWOOD TRANSIT CENTER                     |  | No Revisions: |  | TRG M535-014   |    |                |                  |                   |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                                     |  |                 | 09/17/24 | 50% CD   | LW/SH |                                                  |  | Revised:      |  | Designer:      | LW | Structure      | 25924            |                   |
| Vert. Scale: As Noted                                                                                                                                                                                                                                                      |  |                 |          |          |       |                                                  |  | Void:         |  | Detailer:      | SH | Numbers        |                  |                   |
|                                                                                                                                                                                                                                                                            |  |                 |          |          |       |                                                  |  |               |  | Sheet Subset:  |    | Subset Sheets: | of               | Sheet Number L200 |
| <div><div><div></div><div>SEH</div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  |                 |          |          |       | 2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  |               |  |                |    |                |                  |                   |



LEGEND

- PROPERTY BOUNDARY
- SHEET MATCHLINE
- EXISTING CONTOURS
- EXISTING TREES TO REMAIN
- NATIVE SEEDING REVEGETATION;  
SEE MASTER PLAN LIST SCHEDULE
- TRANSIT SHRUB AREAS
- PROPOSED PERMANENT DRIP IRRIGATION
- PROPOSED TEMPORARY SPRAY IRRIGATION

NOTE: ALL B&B MATERIAL TO RECEIVE PERMANENT BUBBLER/DRIP RING IRRIGATION.



TRANSIT BUILDING SITE LANDSCAPE DATA CHART

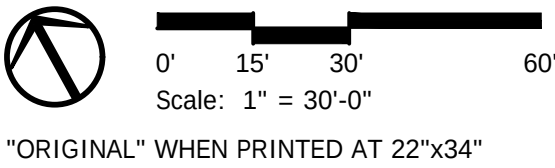
| LOT SIZE INFORMATION     | ACRES                                     | SQUARE FEET                             |
|--------------------------|-------------------------------------------|-----------------------------------------|
|                          | 5.03 ACRES                                | 219,107 SF.                             |
| LOT AREA TO BE DISTURBED | 3.15 ACRES                                | 138,380 SF.                             |
| TOTAL LANDSCAPED AREA    | REQUIRED (SQ.FT. + 15% OF DISTURBED AREA) | PROPOSED (SQ.FT. + % OF DISTURBED AREA) |
|                          | 20,757 SF (15%)                           | 42,760 SF. (31%)                        |

TRANSIT BUILDING LANDSCAPE PLANTING DATA CHART

|                                 | REQUIRED                  |            | PROPOSED |
|---------------------------------|---------------------------|------------|----------|
| OPEN SPACE (TREES)              | 20,757 SF                 | 1/400SF    | 97       |
|                                 |                           | 52         |          |
| OPEN SPACE (SHRUBS)             | 20,757 SF                 | 1/100SF    | 210      |
|                                 |                           | 208        |          |
| WULFSOHN RD. (TREES)            | 875 LF (NEW CONSTRUCTION) | 1/50 LF    | 16       |
|                                 |                           | 18         |          |
| PARKING AREA (TREES)            | 114 SPACES                | 1/8 SPACES | 19       |
|                                 |                           | 15         |          |
| PARKING AREA INTERIOR LANDSCAPE | 114 SPACES                | 1140 SF    | 2325 SF  |
|                                 |                           |            |          |

HYDROZONE NOTES

- THIS PLAN IS FOR IRRIGATION DESIGN PURPOSES ONLY. IRRIGATION DESIGNER SHALL SUBMIT AN IRRIGATION DESIGN TO LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
- SOURCE OF WATER: TBD. GLENWOOD MEADOWS RAW WATER SYSTEM PREFERRED SOURCE.
- FOR DESIGN PURPOSES, ASSUME STATIC PRESSURE OF 75 PSI. MAXIMUM FLOW PER ZONE IS 25 GPM.
- ALL VALVES SHALL BE SCRUBBER-TYPE SUITABLE FOR USE WITH RAW/DIRTY WATER SYSTEMS.
- MAINLINE SHALL BE SCHEDULE 40 PVC.
- SLEEVING IS REQUIRED FOR MAINLINE AND ALL LATERALS LOCATED UNDER HARDSCAPE, SEE PLAN FOR LOCATIONS. (1) 3" PVC PIPE FOR IRRIGATION SLEEVING AND (1) 1 1/2" PVC PIPE FOR ELECTRICAL SLEEVING SHALL BE PROVIDED IN EACH LOCATION.
- THE HYDROZONES INDICATED MAY BE SEPARATED INTO ADDITIONAL ZONES, BUT NO ZONES SHALL BE JOINED TOGETHER.
- PLANTING BEDS SHALL BE SPRAY IRRIGATED WITH POP-UPS WHERE FEASIBLE; FOR SMALL AREAS OR AREAS WITH RESTRICTIVE GEOMETRY, DRIP CAN BE USED. DO NOT COMBINE DRIP AND SPRAY IRRIGATION ON THE SAME VALVE.
- ALL TREES OUTSIDE PLANTING BEDS SHALL BE DRIP/BUBBLER IRRIGATED.
- REVEGETATION AREAS SHALL BE TEMPORARILY IRRIGATED WITH ROTOR SPRAY. TEMPORARY IRRIGATION SHALL BE BURIED AS TYPICAL, BUT ABANDONED UPON ESTABLISHMENT OF LIVE COVER.
- DO NOT COMBINE DIFFERENT IRRIGATION TYPES ON ONE ZONE.
- NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCIES BETWEEN PLANS AND/OR BID AND CONSTRUCTION DOCUMENTS



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Horiz. Scale: As Noted      Vert. Scale: As Noted

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Rev.

Date

Comments

Init.

09/17/24

50% CD

LW/SH

ROARING FORK TRANSPORTATION AUTHORITY

WEST GLENWOOD TRANSIT CENTER

2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

FIR Plans

No Revisions:

Revised:

Void:

6A HYDROZONE & LANDSCAPE DATA

Designer: LW

Detailer: SH

Sheet Subset:

Structure Numbers

Subset Sheets: of

Project No./Code

TRG M535-014

25924

Sheet Number L201

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Packet Page 491



LEGEND

PROPERTY BOUNDARY

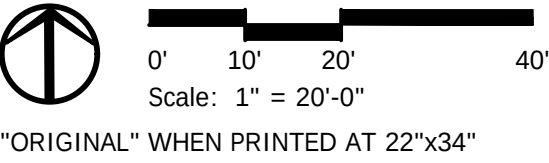
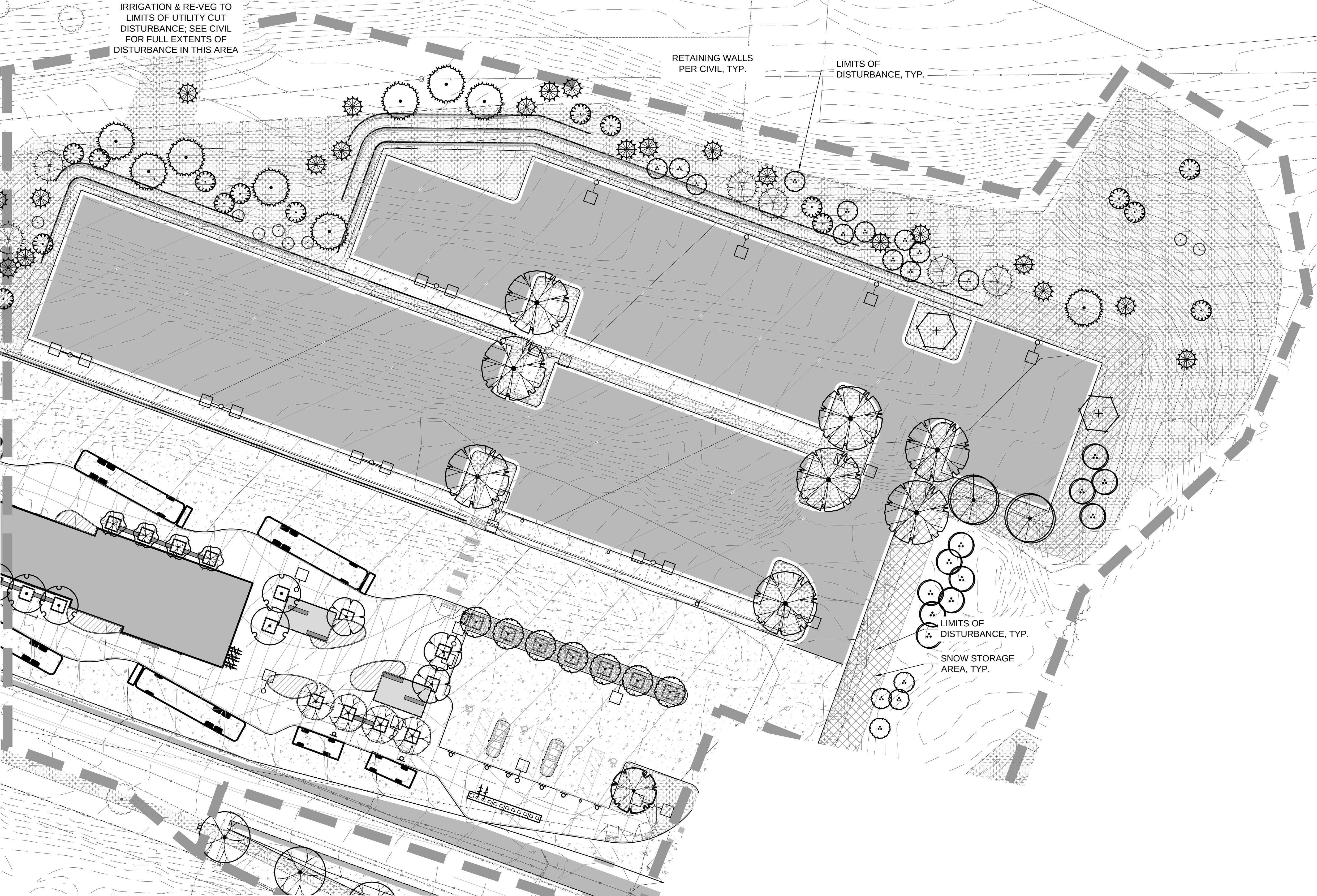
SHEET MATCHLINE

EXISTING CONTOURS

EXISTING TREES TO REMAIN

PLANT SCHEDULE

| SYMBOL        | CODE    | BOTANICAL / COMMON NAME                                                |
|---------------|---------|------------------------------------------------------------------------|
| TREES         |         |                                                                        |
|               | ACE GLA | Acer glabrum / Rocky Mountain Maple                                    |
|               | AS2     | Acer negundo 'Sensation' / Sensation Box Elder                         |
|               | AC      | Acer platanoides 'Columnare' / Columnar Norway Maple                   |
|               | AR      | Acer platanoides 'Royal Red' / Royal Red Norway Maple                  |
|               | AT      | Acer tataricum 'Hot Wings' / 'Hot Wings' Tatarian Maple                |
|               | CC      | Celtis occidentalis 'Chicagoland' / Chicagoland Hackberry              |
|               | GI      | Gleditsia triacanthos inermis 'Imperial' / Imperial Honey Locust       |
|               | GS      | Gleditsia triacanthos inermis 'Shademaster' / Shademaster Honey Locust |
|               | JS2     | Juniperus monosperma / One-seed Juniper                                |
|               | JO      | Juniperus osteosperma / Utah Juniper                                   |
|               | KP      | Koeleruteria paniculata / Golden Rain Tree                             |
|               | MS      | Malus x 'Spring Snow' / Spring Snow Crabapple                          |
|               | PB      | Picea glauca densata / Black Hills Spruce                              |
|               | PC      | Picea pungens / Colorado Spruce                                        |
|               | PP      | Pinus edulis / Pinion Pine                                             |
|               | PIN PON | Pinus ponderosa / Ponderosa Pine                                       |
|               | QUE GAM | Quercus gambelii / Gambel Oak                                          |
|               | SA      | Sorbus americana / Mountain Ash                                        |
|               | SI      | Syringa reticulata 'Ivory Silk' / Ivory Silk Japanese Tree Lilac       |
|               | TC      | Tilia cordata / Littleleaf Linden                                      |
|               | UI      | Ulmus davidiana japonica / prospector                                  |
| SHRUB AREAS   |         |                                                                        |
|               |         | TRANSIT SHRUB AREAS                                                    |
| GROUND COVERS |         |                                                                        |
|               |         | NATIVE SEED                                                            |
|               |         | NATIVE STORMWATER BASIN MIX                                            |



NOTE: DETAILED SHRUB AND PERENNIAL LAYOUT TO BE PROVIDED AT 100 PERCENT CD SET

|                                                                                                                                                                                                                                                                                      |  |                 |          |          |       |                                                                       |  |               |                                               |                          |                   |  |                          |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------|----------|----------|-------|-----------------------------------------------------------------------|--|---------------|-----------------------------------------------|--------------------------|-------------------|--|--------------------------|--|
| Print Date: 9/17/2024 2:58 PM                                                                                                                                                                                                                                                        |  | Sheet Revisions |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br>WEST GLENWOOD TRANSIT CENTER |  | FIR Plans     |                                               | PLANTING PLAN<br>6A EAST |                   |  | Project No./Code         |  |
| File Name: 0-23019-PLANTING_TRANSIT.dwg                                                                                                                                                                                                                                              |  | Rev.            | Date     | Comments | Init. |                                                                       |  | No Revisions: | Designer: LW<br>Detailer: SH<br>Sheet Subset: | Structure Numbers        | Subset Sheets: of |  | TRG M535-014             |  |
| Horiz. Scale: As Noted Vert. Scale: As Noted                                                                                                                                                                                                                                         |  | <div></div>     | 09/17/24 | 50% CD   | LW/SH | 2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601                      |  | Revised:      |                                               |                          |                   |  | 25924                    |  |
| <div><div><div></div><div>Short Elliott Hendrickson Inc.</div><div>Colorado Center Tower One</div><div>Suite 6000</div><div>2000 South Colorado Boulevard</div><div>Denver, CO 80222-7900</div></div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>     |          |          |       |                                                                       |  | Void:         |                                               |                          |                   |  | Sheet Number <b>L202</b> |  |



LEGEND

PROPERTY BOUNDARY

SHEET MATCHLINE

EXISTING CONTOURS

EXISTING TREES TO REMAIN

PLANT SCHEDULE

| SYMBOL        | CODE    | BOTANICAL / COMMON NAME                                                | CONT      |
|---------------|---------|------------------------------------------------------------------------|-----------|
| TREES         |         |                                                                        |           |
|               | ACE GLA | Acer glabrum / Rocky Mountain Maple                                    | CLUMP     |
|               | AS2     | Acer negundo 'Sensation' / Sensation Box Elder                         | 2.5" CAL. |
|               | AC      | Acer platanoides 'Columnare' / Columnar Norway Maple                   | 2.5" CAL. |
|               | AR      | Acer platanoides 'Royal Red' / Royal Red Norway Maple                  | 2.5" CAL. |
|               | AT      | Acer tataricum 'Hot Wings' / 'Hot Wings' Tatarian Maple                | CLUMP     |
|               | CC      | Celtis occidentalis 'Chicagoland' / Chicagoland Hackberry              | 2.5" CAL. |
|               | GI      | Gleditsia triacanthos inermis 'Imperial' / Imperial Honey Locust       | 2.5" CAL. |
|               | GS      | Gleditsia triacanthos inermis 'Shademaster' / Shademaster Honey Locust | 2.5" CAL. |
|               | JS2     | Juniperus monosperma / Oneseed Juniper                                 | B & B     |
|               | JO      | Juniperus osteosperma / Utah Juniper                                   | B & B     |
|               | KP      | Koeleruteria paniculata / Golden Rain Tree                             | 2.5" CAL. |
|               | MS      | Malus x 'Spring Snow' / Spring Snow Crabapple                          | 2.5" CAL. |
|               | PB      | Picea glauca densata / Black Hills Spruce                              | B & B     |
|               | PC      | Picea pungens / Colorado Spruce                                        | B & B     |
|               | PP      | Pinus edulis / Pinion Pine                                             | B & B     |
|               | PIN PON | Pinus ponderosa / Ponderosa Pine                                       | B & B     |
|               | QUE GAM | Quercus gambeli / Gambel Oak                                           | B & B     |
|               | SA      | Sorbus americana / Mountain Ash                                        | 2.5" CAL. |
|               | SI      | Syringa reticulata 'Ivory Silk' / Ivory Silk Japanese Tree Lilac       | 2" Cal.   |
|               | TC      | Tilia cordata / Littleleaf Linden                                      | 2.5" CAL. |
|               | UI      | ulmus davidiana japonica / prospector                                  | 2.5" CAL. |
| SYMBOL        | CODE    | BOTANICAL / COMMON NAME                                                | CONT      |
| SHRUB AREAS   |         |                                                                        |           |
|               |         | TRANSIT SHRUB AREAS                                                    |           |
| GROUND COVERS |         |                                                                        |           |
|               |         | NATIVE SEED                                                            |           |
|               |         | NATIVE STORMWATER BASIN MIX                                            |           |



0'10'20'40'

Scale: 1" = 20'-0"

"ORIGINAL" WHEN PRINTED AT 22"x34"

NOTE: DETAILED SHRUB AND PERRENIAL LAYOUT TO BE PROVIDED AT 100% CD SET

|                                                                                                                                                                                                                                                   |  |                 |          |          |       |                                                                                                                               |  |               |  |                                |           |  |                          |                  |  |
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| Print Date: 9/17/2024 2:58 PM                                                                                                                                                                                                                     |  | Sheet Revisions |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br>WEST GLENWOOD TRANSIT CENTER<br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |  | PLANTING PLAN<br>6A SOUTH WEST |           |  |                          | Project No./Code |  |
| File Name: 0-23019-PLANTING_TRANSIT.dwg                                                                                                                                                                                                           |  | Rev.            | Date     | Comments | Init. |                                                                                                                               |  | No Revisions: |  |                                |           |  |                          | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                 |  | <div></div>     | 09/17/24 | 50% CD   | LW/SH |                                                                                                                               |  | Revised:      |  | Designer: LW                   | Structure |  | 25924                    |                  |  |
| <div><div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>     |          |          |       |                                                                                                                               |  | Void:         |  | Detailer: SH                   | Numbers   |  | Sheet Number <b>L203</b> |                  |  |
|                                                                                                                                                                                                                                                   |  | <div></div>     |          |          |       |                                                                                                                               |  | Sheet Subset: |  | Subset Sheets: of              |           |  |                          |                  |  |



LEGEND

PROPERTY BOUNDARY

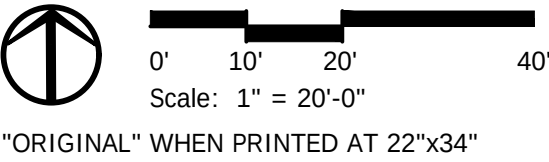
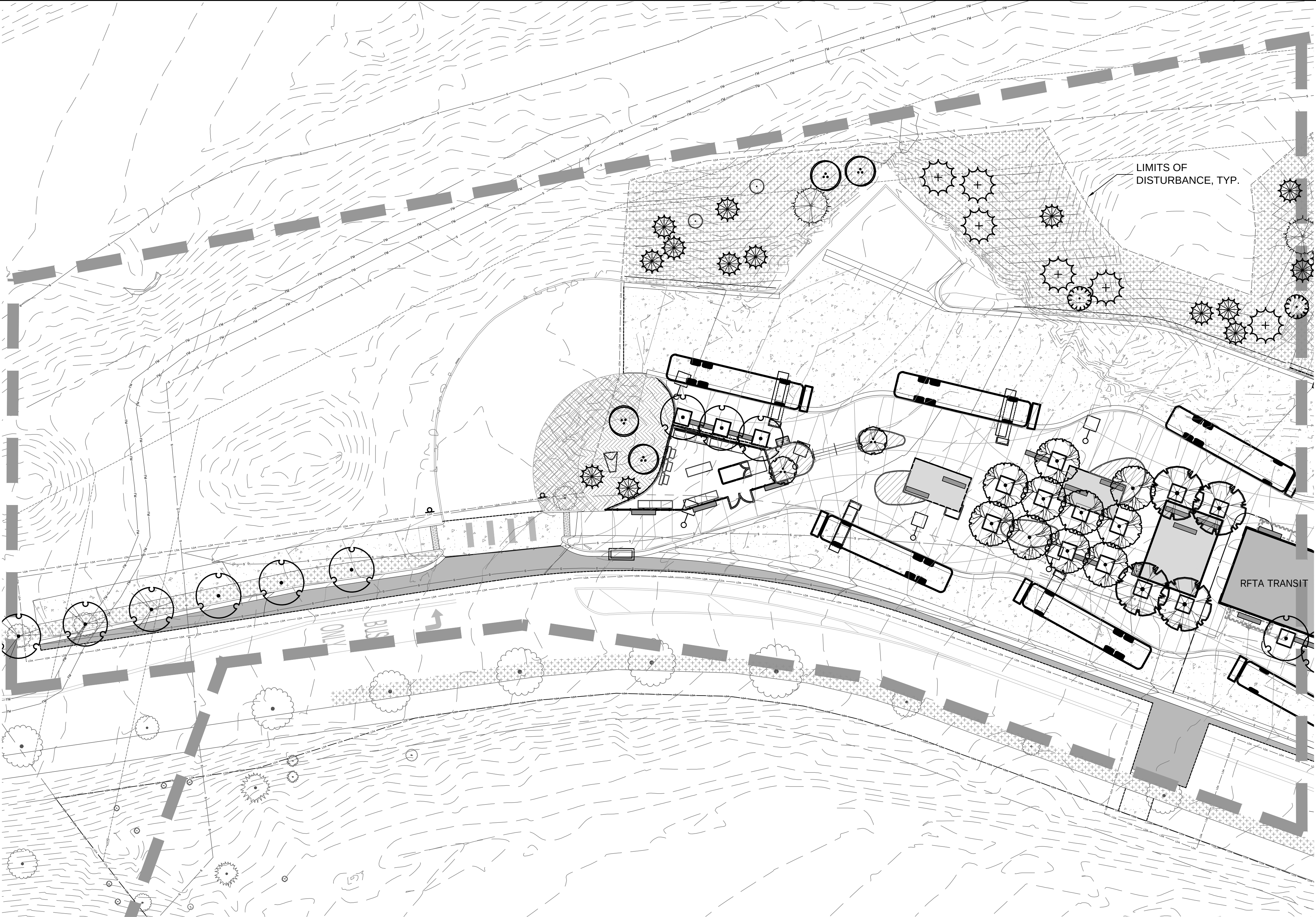
SHEET MATCHLINE

EXISTING CONTOURS

EXISTING TREES TO REMAIN

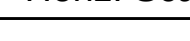
PLANT SCHEDULE

| SYMBOL        | CODE    | BOTANICAL / COMMON NAME                                                | CONT      |
|---------------|---------|------------------------------------------------------------------------|-----------|
| TREES         |         |                                                                        |           |
|               | ACE GLA | Acer glabrum / Rocky Mountain Maple                                    | CLUMP     |
|               | AS2     | Acer negundo 'Sensation' / Sensation Box Elder                         | 2.5" CAL. |
|               | AC      | Acer platanoides 'Columnare' / Columnar Norway Maple                   | 2.5" CAL. |
|               | AR      | Acer platanoides 'Royal Red' / Royal Red Norway Maple                  | 2.5" CAL. |
|               | AT      | Acer tataricum 'Hot Wings' / 'Hot Wings' Tatarian Maple                | CLUMP     |
|               | CC      | Celtis occidentalis 'Chicagoland' / Chicagoland Hackberry              | 2.5" CAL. |
|               | GI      | Gleditsia triacanthos inermis 'Imperial' / Imperial Honey Locust       | 2.5" CAL. |
|               | GS      | Gleditsia triacanthos inermis 'Shademaster' / Shademaster Honey Locust | 2.5" CAL. |
|               | JS2     | Juniperus monosperma / Oneseed Juniper                                 | B & B     |
|               | JO      | Juniperus osteosperma / Utah Juniper                                   | B & B     |
|               | KP      | Koeleruteria paniculata / Golden Rain Tree                             | 2.5" CAL. |
|               | MS      | Malus x 'Spring Snow' / Spring Snow Crabapple                          | 2.5" CAL. |
|               | PB      | Picea glauca densata / Black Hills Spruce                              | B & B     |
|               | PC      | Picea pungens / Colorado Spruce                                        | B & B     |
|               | PP      | Pinus edulis / Pinion Pine                                             | B & B     |
|               | PIN PON | Pinus ponderosa / Ponderosa Pine                                       | B & B     |
|               | QUE GAM | Quercus gambelii / Gambel Oak                                          | B & B     |
|               | SA      | Sorbus americana / Mountain Ash                                        | 2.5" CAL. |
|               | SI      | Syringa reticulata 'Ivory Silk' / Ivory Silk Japanese Tree Lilac       | 2" Cal.   |
|               | TC      | Tilia cordata / Littleleaf Linden                                      | 2.5" CAL. |
|               | UI      | ulmus davidiana japonica / prospector                                  | 2.5" CAL. |
| SYMBOL        | CODE    | BOTANICAL / COMMON NAME                                                | CONT      |
| SHRUB AREAS   |         |                                                                        |           |
|               |         | TRANSIT SHRUB AREAS                                                    |           |
| GROUND COVERS |         |                                                                        |           |
|               |         | NATIVE SEED                                                            |           |
|               |         | NATIVE STORMWATER BASIN MIX                                            |           |



NOTE: DETAILED SHRUB AND PERRENIAL LAYOUT TO BE PROVIDED AT 100% CD SET

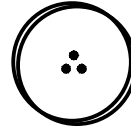
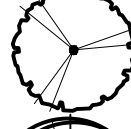
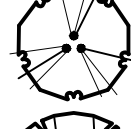
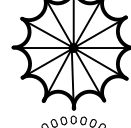
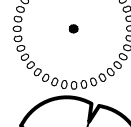
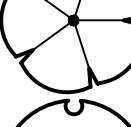
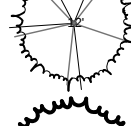
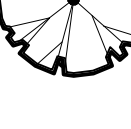
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| Print Date: 9/17/2024 2:58 PM                                                                                                                                                                                                                                                                            |  | Sheet Revisions |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br>WEST GLENWOOD TRANSIT CENTER<br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans     |         | PLANTING PLAN<br>6A WEST |                          |  | Project No./Code |  |
| File Name: 0-23019-PLANTING_TRANSIT.dwg                                                                                                                                                                                                                                                                  |  | Rev.            | Date     | Comments | Init. |                                                                                                                               |  | No Revisions: |         |                          |                          |  | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                        |  | <div></div>     | 09/17/24 | 50% CD   | LW/SH |                                                                                                                               |  | Revised:      |         | Designer: LW             | Structure                |  | 25924            |  |
| <div> Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div> |  | <div></div>     |          |          |       | Void:                                                                                                                         |  | Detailer: SH  | Numbers |                          | Sheet Number <b>L204</b> |  |                  |  |
|                                                                                                                                                                                                                                                                                                          |  | <div></div>     |          |          |       |                                                                                                                               |  | Sheet Subset: |         | Subset Sheets:      of   |                          |  |                  |  |



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PLANT SCHEDULE

| SYMBOL                                                                              | CODE    | BOTANICAL / COMMON NAME                                                | CONT      | SIZE  |
|-------------------------------------------------------------------------------------|---------|------------------------------------------------------------------------|-----------|-------|
| TREES                                                                               |         |                                                                        |           |       |
|    | ACE GLA | Acer glabrum / Rocky Mountain Maple                                    | CLUMP     | 5'    |
|    | AS2     | Acer negundo 'Sensation' / Sensation Box Elder                         | 2.5" CAL. |       |
|    | AC      | Acer platanoides 'Columnare' / Columnar Norway Maple                   | 2.5" CAL. |       |
|    | AR      | Acer platanoides 'Royal Red' / Royal Red Norway Maple                  | 2.5" CAL. |       |
|    | AT      | Acer tataricum 'Hot Wings' / 'Hot Wings' Tatarian Maple                | CLUMP     | 5'    |
|    | CC      | Celtis occidentalis 'Chicagoland' / Chicagoland Hackberry              | 2.5" CAL. |       |
|    | GI      | Gleditsia triacanthos inermis 'Imperial' / Imperial Honey Locust       | 2.5" CAL. |       |
|    | GS      | Gleditsia triacanthos inermis 'Shademaster' / Shademaster Honey Locust | 2.5" CAL. |       |
|    | JS2     | Juniperus monosperma / Oneseed Juniper                                 | B & B     | 5'    |
|    | JO      | Juniperus osteosperma / Utah Juniper                                   | B & B     | 5'    |
|    | KP      | Koelreuteria paniculata / Golden Rain Tree                             | 2.5" CAL. |       |
|   | MS      | Malus x 'Spring Snow' / Spring Snow Crabapple                          | 2.5" CAL. |       |
|  | PB      | Picea glauca densata / Black Hills Spruce                              | B & B     | 8-10' |
|  | PC      | Picea pungens / Colorado Spruce                                        | B & B     | 8-10' |
|  | PP      | Pinus edulis / Pinion Pine                                             | B & B     | 7'-8' |
|  | PIN PON | Pinus ponderosa / Ponderosa Pine                                       | B & B     | 8-10' |
|  | QUE GAM | Quercus gambelii / Gambel Oak                                          | B & B     | 5'    |
|  | SA      | Sorbus americana / Mountain Ash                                        | 2.5" CAL. |       |
|  | SI      | Syringa reticulata 'Ivory Silk' / Ivory Silk Japanese Tree Lilac       | 2" Cal.   |       |
|  | TC      | Tilia cordata / Littleleaf Linden                                      | 2.5" CAL. |       |
|  | UI      | ulmus davidiana japonica / prospector                                  | 2.5" CAL. |       |

REVEGETATION SEED MIX

Indian Rice Grass 'Nez Par' – Achnatherum hymenoides 'Nez Par' 3.0 lbs/acre  
Sideoats Grama – Bouteloua curtipedula 'Pierre' 4.0 lbs/acre  
Sandberg Bluegrass – Poa secunda 'Sherman' 0.5 lbs/acre  
Thickspike Wheat Grass – Elymus lanceolatus 2 lbs/acre  
'San Luis' Slender Wheatgrass – Elymus trachycalulus 3lbs/acre  
'Garnet' Mountain Brome – Bromus marginatus 'Garnet' 3 lbs/acre  
Arizona Fescue – Festuca ovina 'Arriba' 2.5 lbs/acre  
'Arriba' Western Wheatgrass – Pascopyrum smithii 'Arriba' 2.5 lbs/acre  
Mountain Sage – Artemesia tridentate vaseyana 0.25 lbs/acre  
Rubber Rabbit Brush – Chrysothamnus nauseosus 2 lbs/acre  
Prairie Sage – Artemesia ludviciana 0.25 lbs/acre  
Fringed Sage – Artemesia frigida 0.25 lbs/acre  
Hairy Golden Aster – Chrysopsis villosa 0.25 lbs/acre  
Silver Lupine – Lupinus argenteus 1.0 lb/acre  
Blue Flax – Linum lewisii 1.0 lb/acre  
Rocky Mountain Penstemon Penstemon strictus 2.0 lbs/acre  
Arrowleaf Balsam Root Balsamorhiza sagittata 0.5 lbs/acre

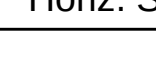
STORMWATER BASIN SEED MIX

Seeding Rate: 2 lb per 1,000 SF

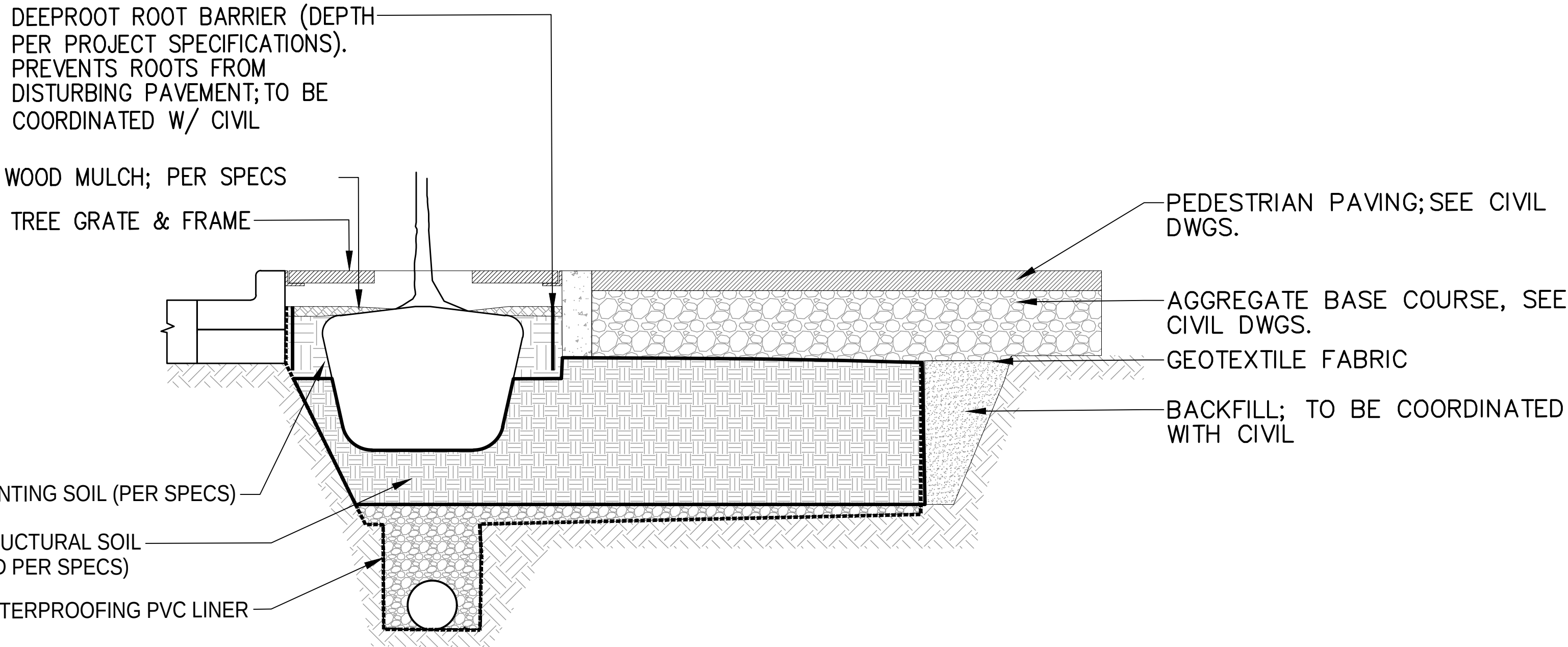
| LATIN NAME                    | COMMON NAME                   | % of MIX |
|-------------------------------|-------------------------------|----------|
| Carex nebrascensis            | Nebraska Carex                | 10       |
| Deschampsia caespitosa        | Tufted Hairgrass              | 25       |
| Elymus lanceolatus var. Sodar | Streambank Wheatgrass 'Sodar' | 15       |
| Juncus torreyi                | Torrey's Rush                 | 20       |
| Koeleria macrantha            | Prairie Junegrass             | 20       |
| Iris missouriensis            | Rocky Mountain Iris           | 10       |

| SYMBOL                                                                                | CODE | BOTANICAL / COMMON NAME     | CONT | SPACING |
|---------------------------------------------------------------------------------------|------|-----------------------------|------|---------|
| SHRUB AREAS                                                                           |      |                             |      |         |
|  |      | TRANSIT SHRUB AREAS         |      |         |
| GROUND COVERS                                                                         |      |                             |      |         |
|  |      | NATIVE SEED                 |      |         |
|  |      | NATIVE STORMWATER BASIN MIX |      |         |

NOTE: DETAILED SHRUB AND PERRENIAL LAYOUT TO BE PROVIDED AT BUILDING PERMIT

|                                                                                                                                                                                                                                                                                                          |  |                 |          |          |       |                                                                                                                               |  |                   |  |                   |           |  |                          |                  |  |
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| Print Date: 9/17/2024 2:58 PM                                                                                                                                                                                                                                                                            |  | Sheet Revisions |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br>WEST GLENWOOD TRANSIT CENTER<br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans         |  | PLANTING SCHEDULE |           |  |                          | Project No./Code |  |
| File Name: 0-23019-PLANTING_TRANSIT.dwg                                                                                                                                                                                                                                                                  |  | Rev.            | Date     | Comments | Init. |                                                                                                                               |  | No Revisions:     |  |                   |           |  |                          | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                        |  | <div></div>     | 09/17/24 | 50% CD   | LW/SH |                                                                                                                               |  | Revised:          |  | Designer: LW      | Structure |  | 25924                    |                  |  |
| <div> Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div> |  | <div></div>     |          |          |       |                                                                                                                               |  | Void:             |  | Detailer: SH      | Numbers   |  | Sheet Number <b>L205</b> |                  |  |
|                                                                                                                                                                                                                                                                                                          |  | <div></div>     |          |          |       | Sheet Subset:                                                                                                                 |  | Subset Sheets: of |  |                   |           |  |                          |                  |  |





STRUCTURAL TOPSOIL MIX & PROCEDURE

- 1) SUBMITTALS NEEDED:
- SOIL ANALYSIS TOPSOIL/ OVERBURDEN AND COMPOST MIX. SOME PROJECTS HAVE SUCCESSFULLY USED THE OVERBURDEN SEAN MELLOW HAS AT THE PIT AND CACALOCO MATERIAL FOR THE COMPOST.
  - PARTICLE SIZE DISTRIBUTION FOR 1.5" SCREENED ROCK
- 2) WHEN WE RECEIVE AND APPROVE THE SUBMITTALS OUTLINED ABOVE, WE WILL MEET ON SITE TO MIX A TRIAL RUN OF THE STRUCTURAL TOPSOIL. PLEASE PROVIDE SOPRIS ENGINEERING AT LEAST A WEEK NOTICE TO SCHEDULE TRIAL RUN. WE WILL NEED YOUR MATERIALS TESTER ON HAND TO COLLECT A SAMPLE OF WHAT WE MIX.

STEPS TO BUILD:

PRELIMINARY RATIOS:

- 1 BUCKET POND TAILINGS/OVERBURDEN
  - 3 BUCKETS COMPOST
  - 4 BUCKETS 1.5" ROCK
- a) WASH 1.5" SCREENED ROCK
- b) MIX COMPONENTS IN DOG DISH WITH WATER UNTIL ENTIRE MIX IS WET.
- c) MATERIALS TESTER WILL COLLECT A SAMPLE AND PROVIDE US WITH A TOPSOIL GRADATION AND HYDROMETER TEST ON THE MIXED MATERIAL.

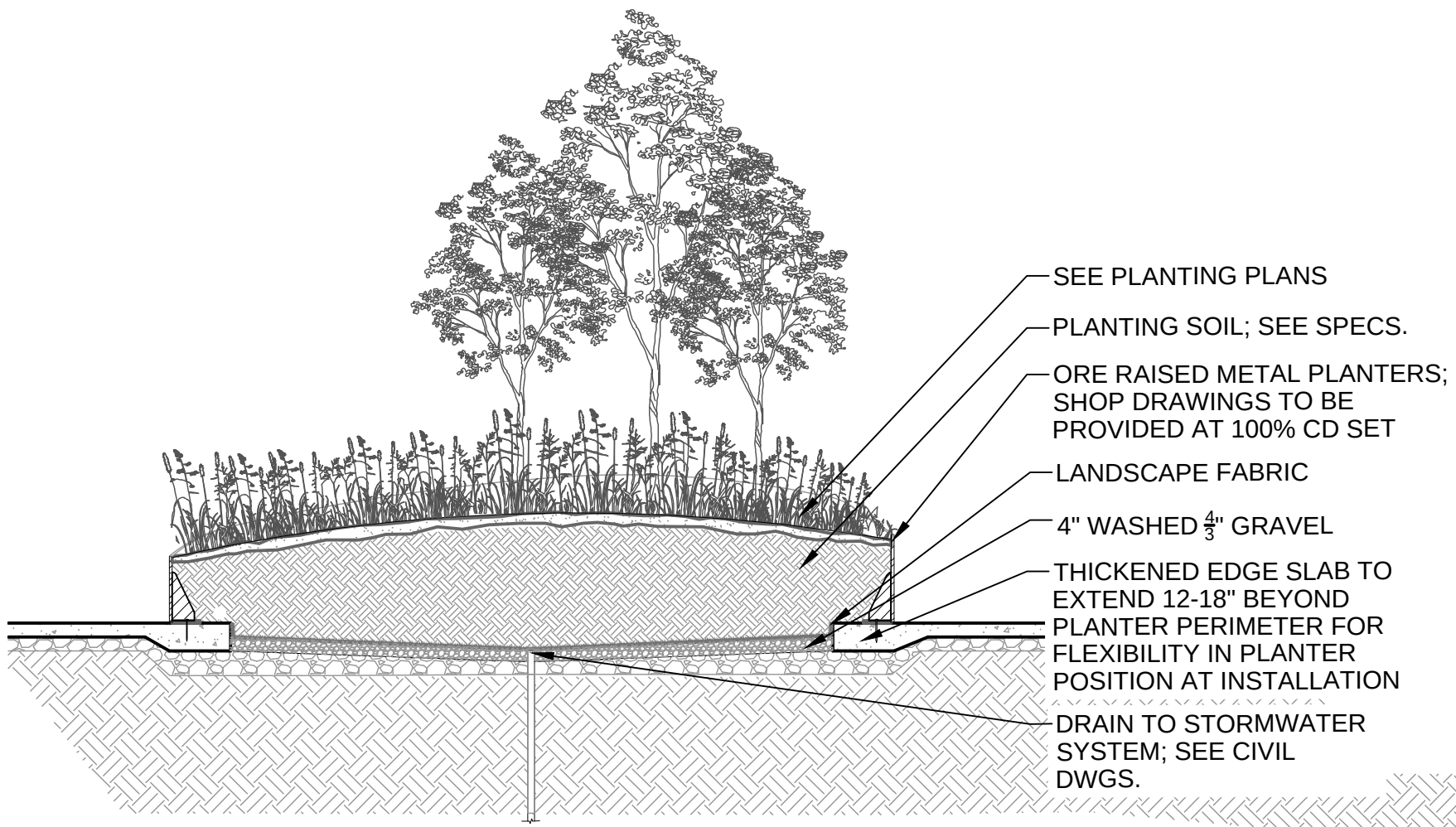
WHEN WE RECEIVE THE TEST RESULTS WE WILL DETERMINE IF WE NEED TO ADJUST THE MIX AND RE-TEST. WHEN WE HAVE A SUCCESSFUL MIX WE WILL FOLLOW THE STEPS BELOW TO BUILD AN INSTALL.

1. WASH 1.5" ROCK
2. MIX COMPONENTS IN DOG DISH WITH WATER UNTIL ENTIRE MIX IS WET
3. TRANSPORT MATERIAL IN LOADER
4. PLACE GENTLY IN TRENCH WITH LOADER
5. SPREAD AS NECESSARY WITH MINI
6. 12" LIFTS
7. ONE PASS FORWARD AND BACK WITH WALK BEHIND

NOTE: EXACT STRUCTURAL SOIL SPECIFICATION TO BE COORDINATED W/ CONTRACTOR

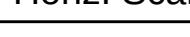
1  
L301 STRUCTURAL SOIL @ TREE GRATES

SCALE: 1" = 1' - 0"



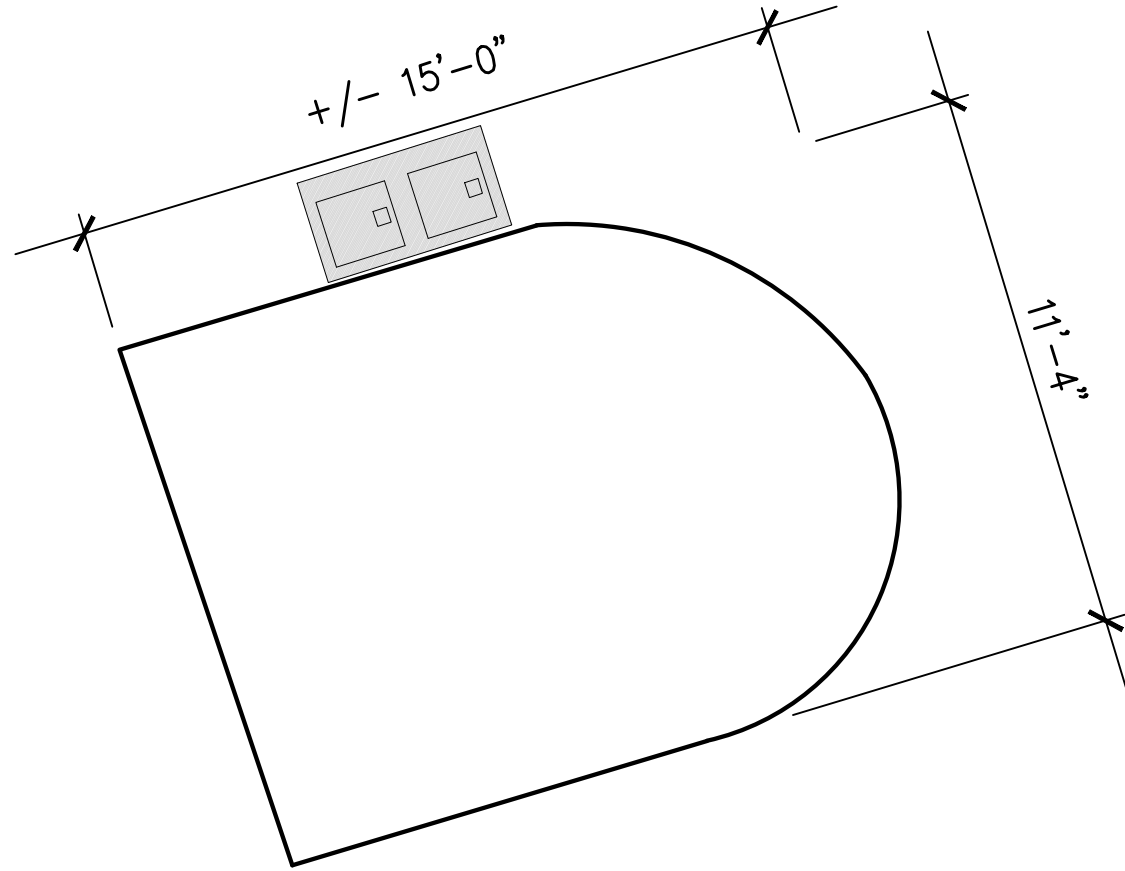
2  
L301 RAISED METAL PLANTER (FOR COORDINATION)

SCALE: NTS

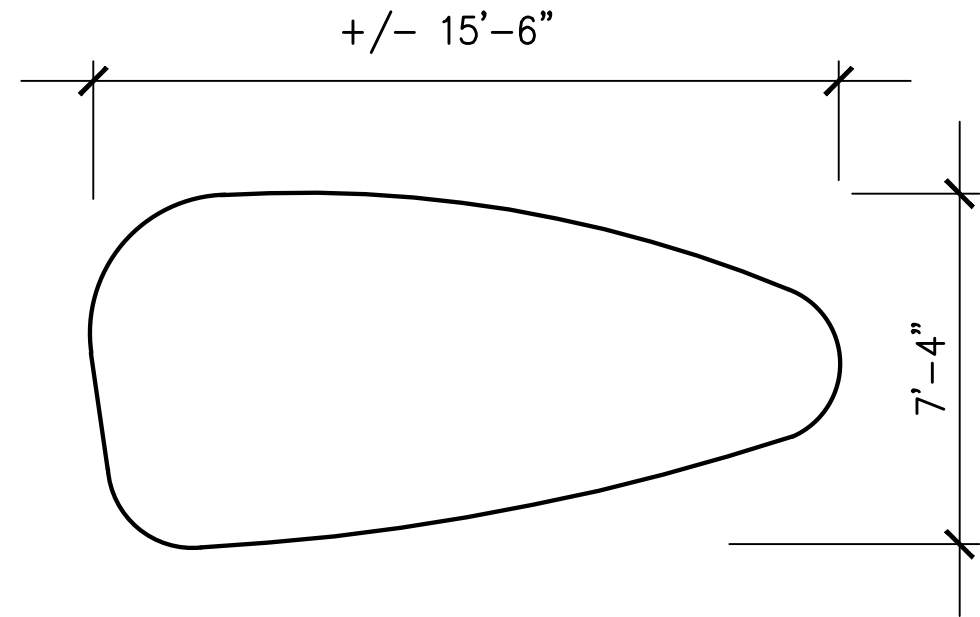
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| Print Date: 9/17/2024 2:58 PM                                                                                                                                                                                                                                                                            |  | Sheet Revisions       |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br>WEST GLENWOOD TRANSIT CENTER |  | FIR Plans     |  | SITE<br>DETAILS        |                   |                          |  | Project No./Code |  |
| File Name: 0-23019-DETAILS_Transit.dwg                                                                                                                                                                                                                                                                   |  | Rev.                  | Date     | Comments | Init. |                                                                       |  | No Revisions: |  |                        |                   |                          |  | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                        |  | <input type="radio"/> | 09/17/24 | 50% CD   | LW/SH |                                                                       |  | Revised:      |  | Designer: LW           | Structure Numbers | 25924                    |  |                  |  |
| <div> Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div> |  | <input type="radio"/> |          |          |       | 2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601                      |  | Detailer: SH  |  |                        |                   | Sheet Number <b>L301</b> |  |                  |  |
|                                                                                                                                                                                                                                                                                                          |  | <input type="radio"/> |          |          |       |                                                                       |  | Sheet Subset: |  | Subset Sheets:      of |                   |                          |  |                  |  |
|                                                                                                                                                                                                                                                                                                          |  | <input type="radio"/> |          |          |       |                                                                       |  |               |  |                        |                   |                          |  |                  |  |



NOTE: SHOP DRAWINGS TO  
BE PROVIDED AT 100% CD  
SET



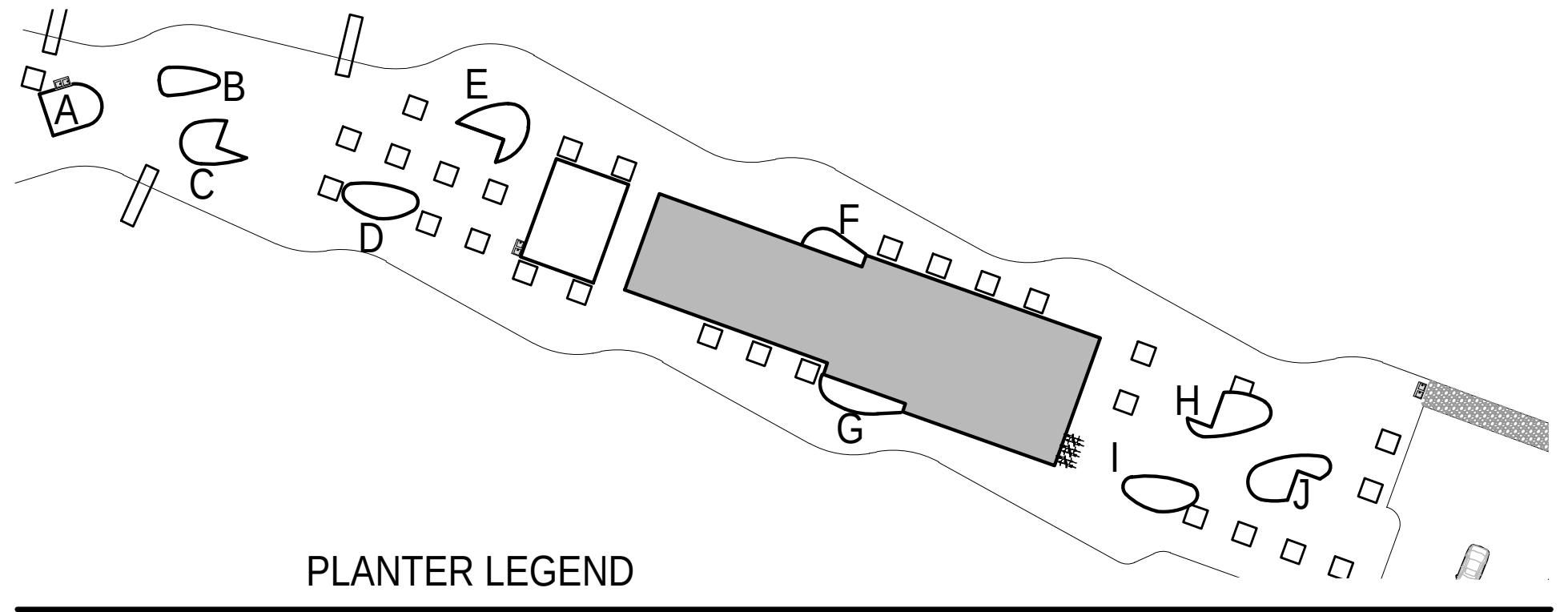
1 RAISED METAL PLANTER A  
L302 SCALE: 1" = 4' - 0"



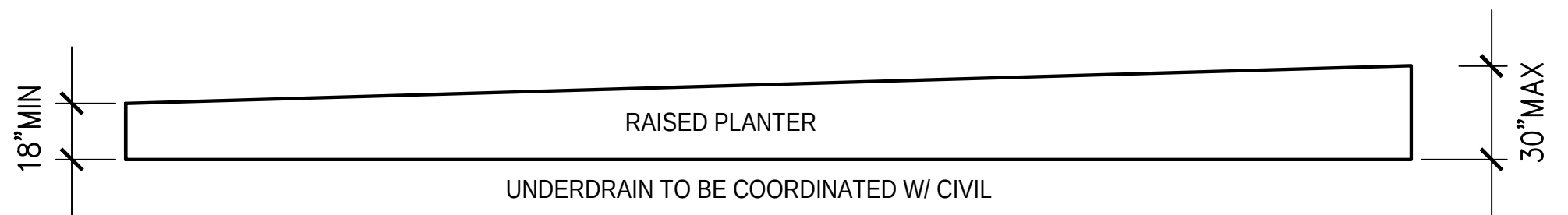
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L302 SCALE: 1" = 4' - 0"



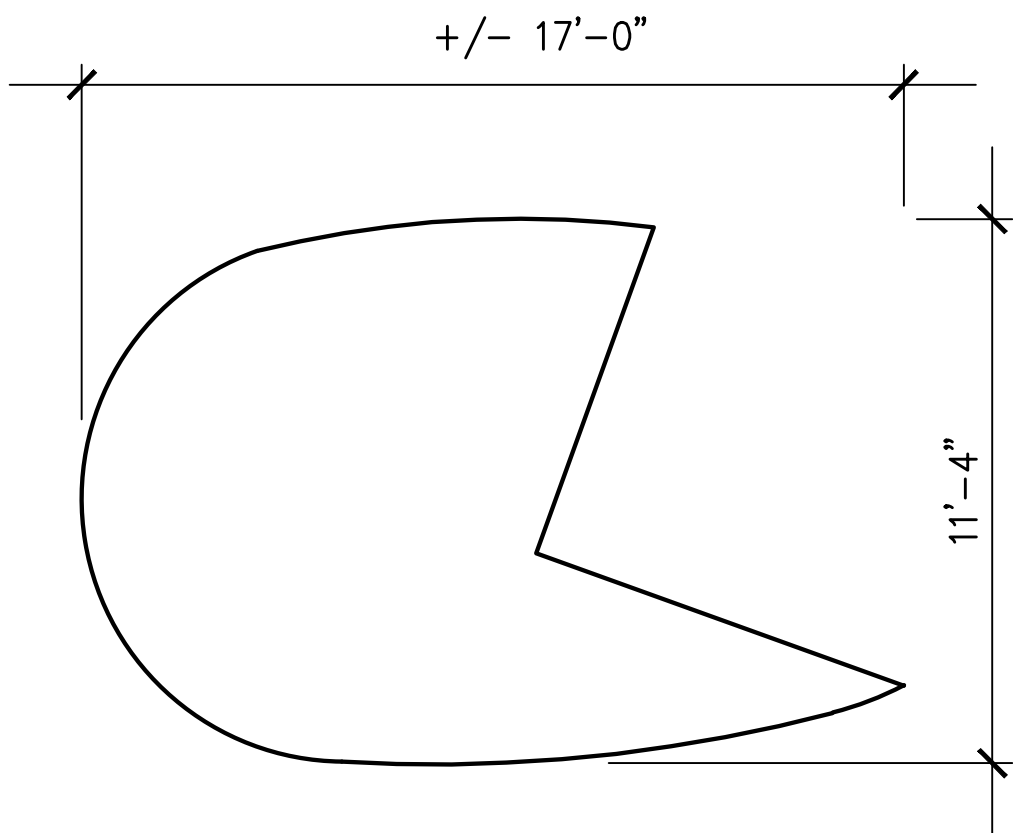
DESIGN INTENT IMAGERY (FINAL FINISH TBD)



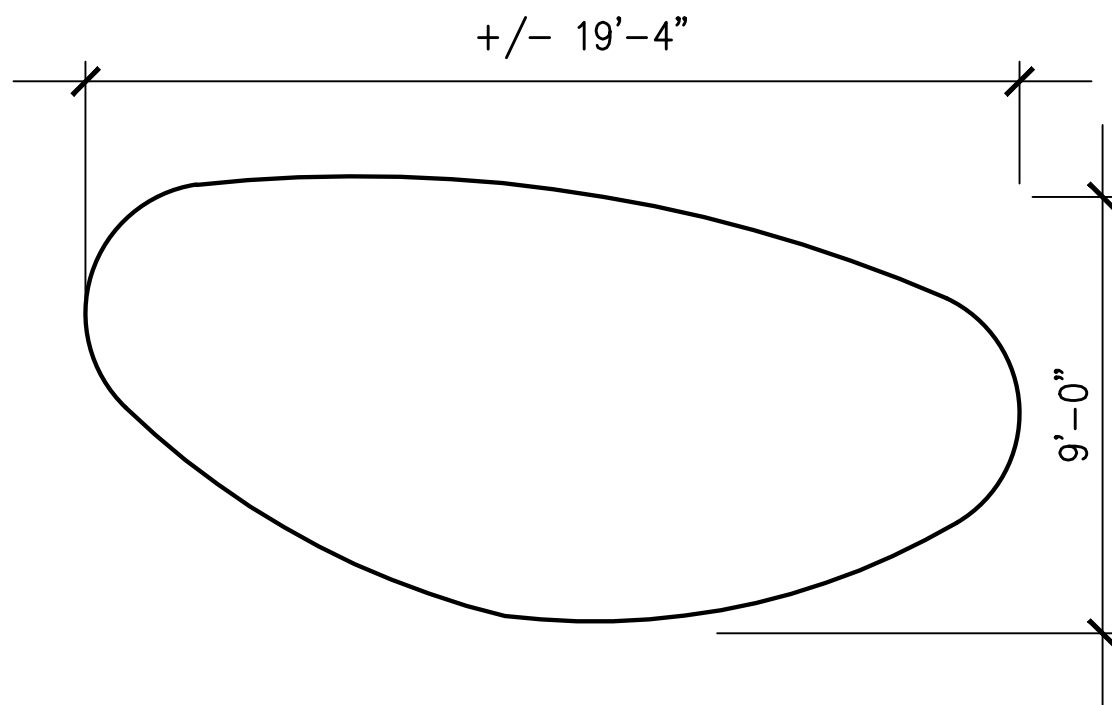
PLANTER LEGEND



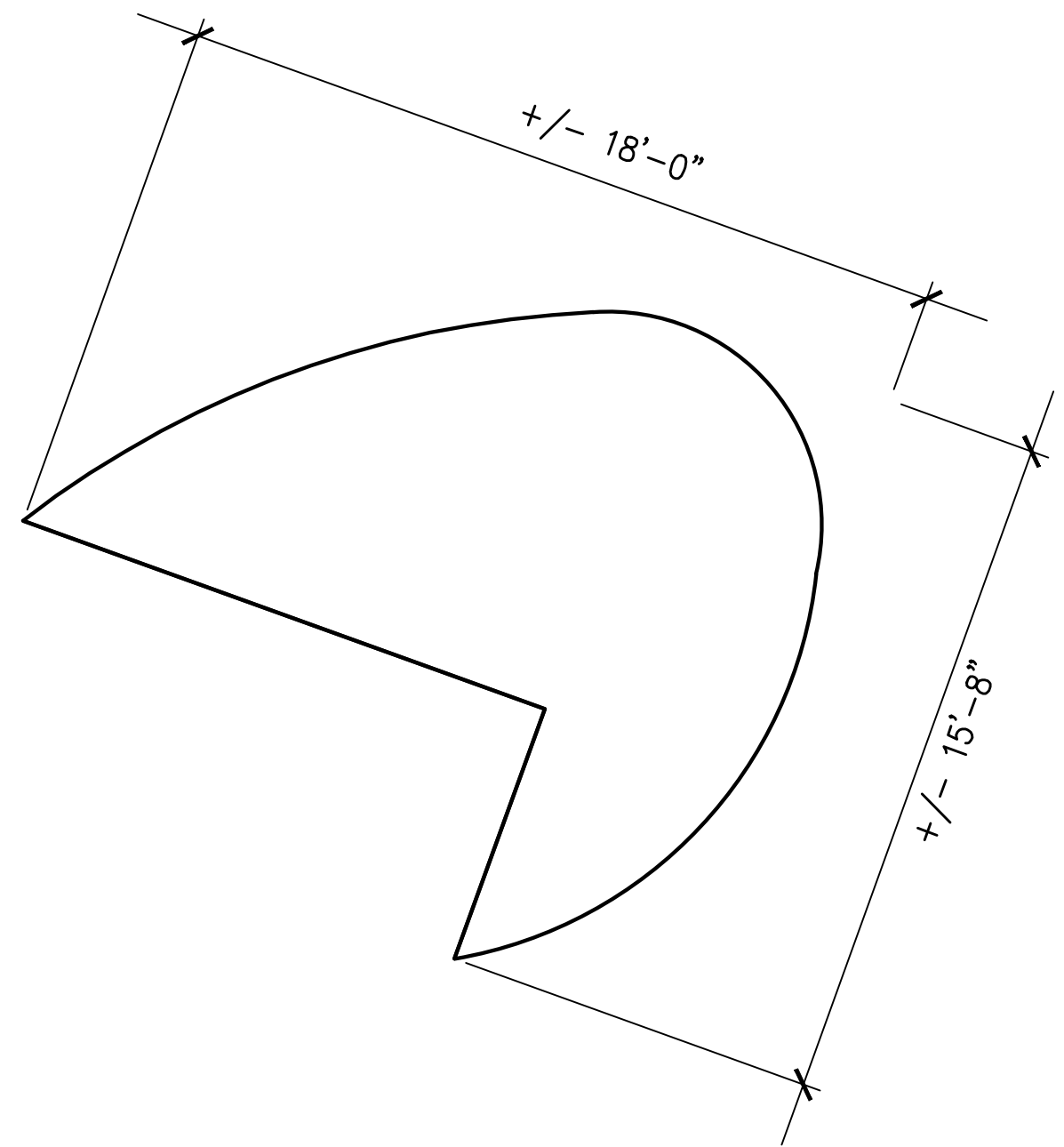
9 RAISED METAL PLANTER TYPICAL VERTICAL DIMENSIONS  
L302 SCALE: 1" = 4' - 0"



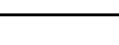
3 RAISED METAL PLANTER C  
L302 SCALE: 1" = 4' - 0"



4 RAISED METAL PLANTER D  
L302 SCALE: 1" = 4' - 0"

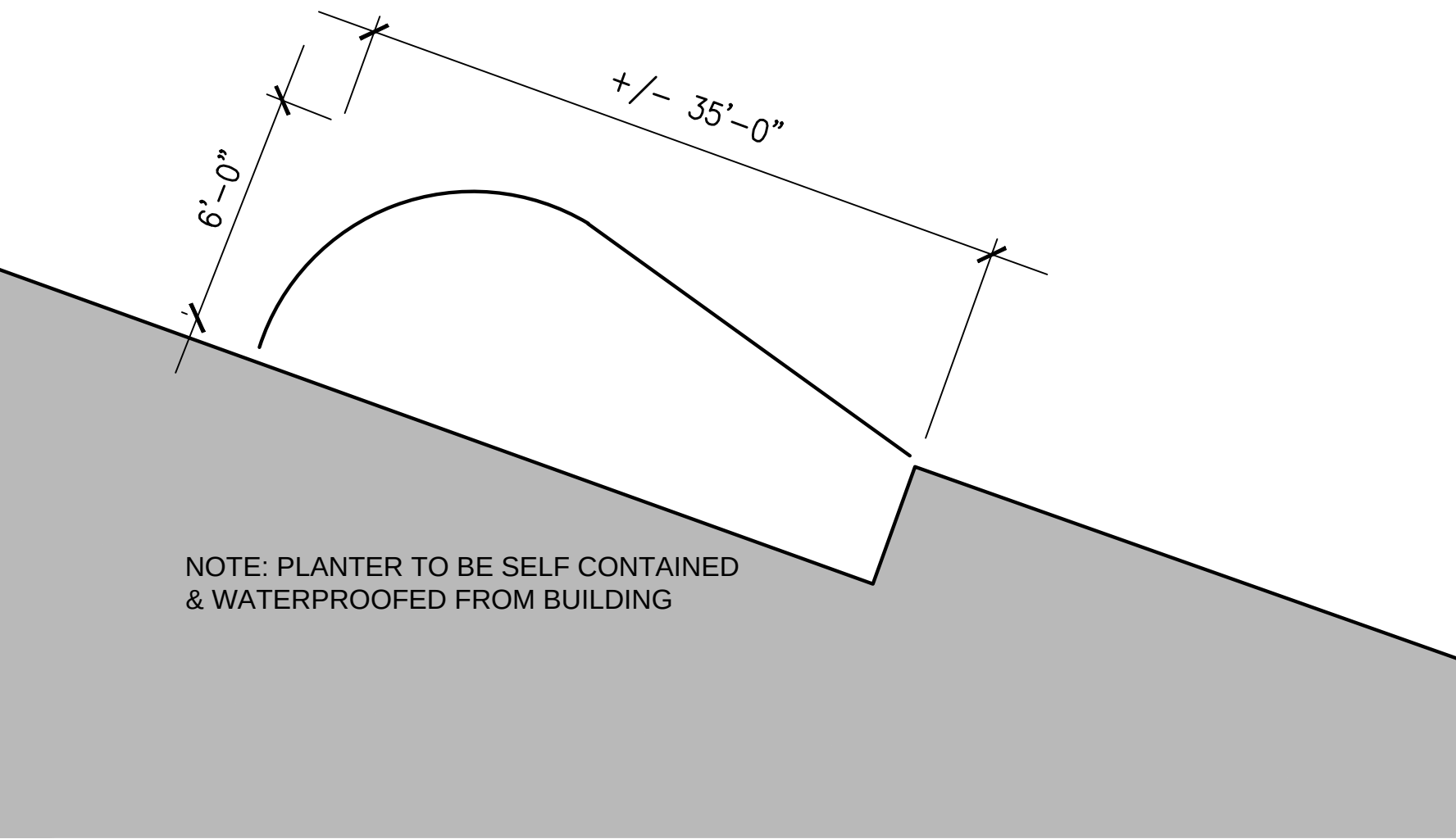


5 RAISED METAL PLANTER E  
L302 SCALE: 1" = 4' - 0"

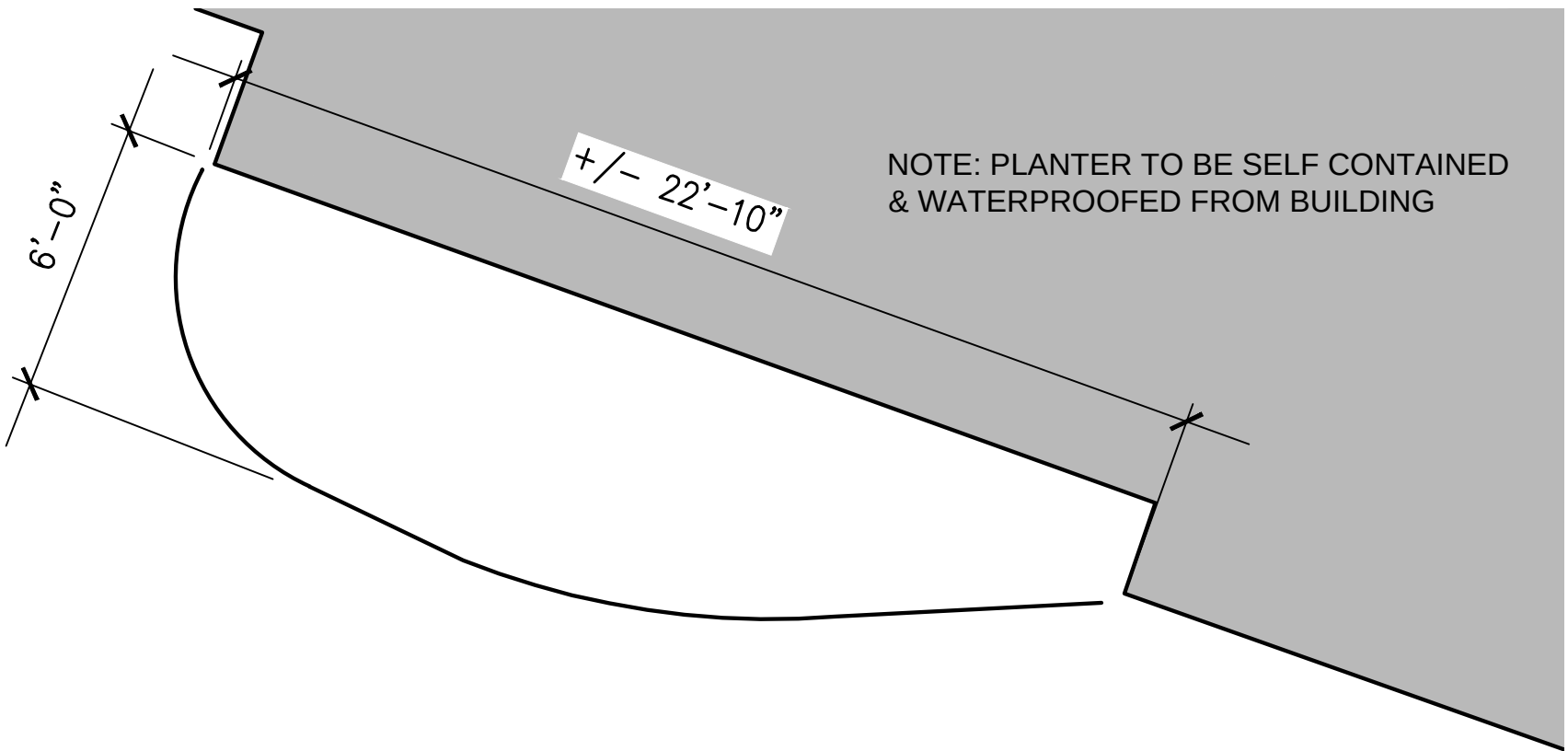
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| File Name: 0-23019-DETAILS_Transit.dwg                                                                                                                                                                                                                                                 |  | Rev.                  | Date     | Comments | Init. |                                                                                                                               |  |              |  | No Revisions:            |  |                 |                   |       |  | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                      |  | <input type="radio"/> | 09/17/24 | 50% CD   | LW/SH |                                                                                                                               |  |              |  | Revised:                 |  | Designer: LW    | Structure Numbers | 25924 |  |                  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |  | <input type="radio"/> |          |          |       | Void:                                                                                                                         |  | Detailer: SH |  | Sheet Number <b>L302</b> |  |                 |                   |       |  |                  |  |
|                                                                                                                                                                                                                                                                                        |  | <input type="radio"/> |          |          |       |                                                                                                                               |  |              |  |                          |  |                 |                   |       |  |                  |  |
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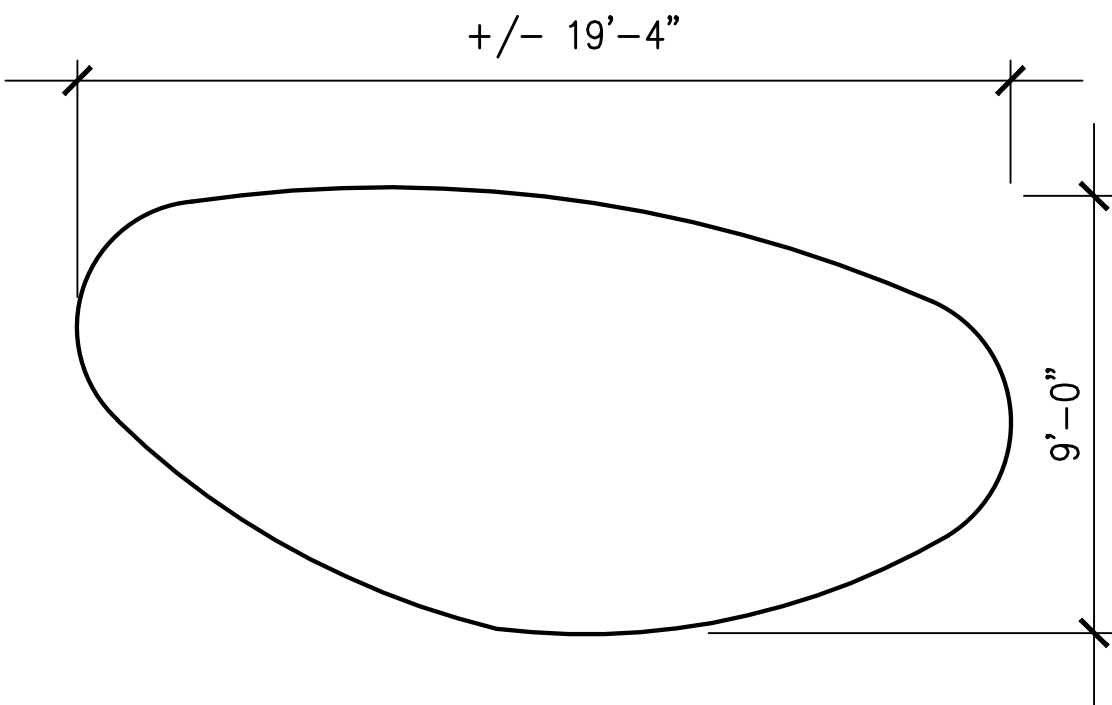
NOTE: SHOP DRAWINGS TO  
BE PROVIDED AT 100% CD  
SET



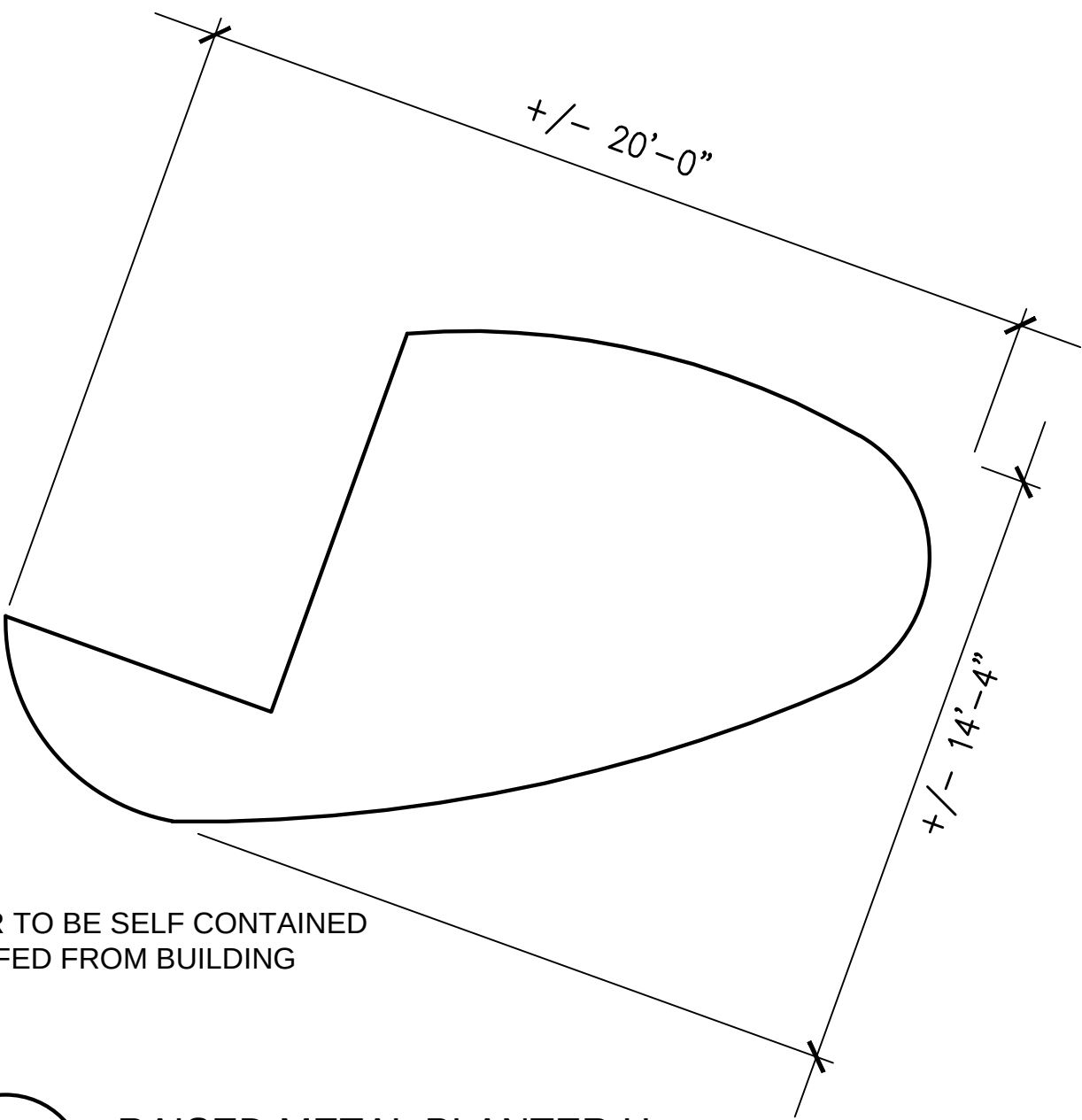
1 RAISED METAL PLANTER F  
L303 SCALE: 1" = 4' - 0"



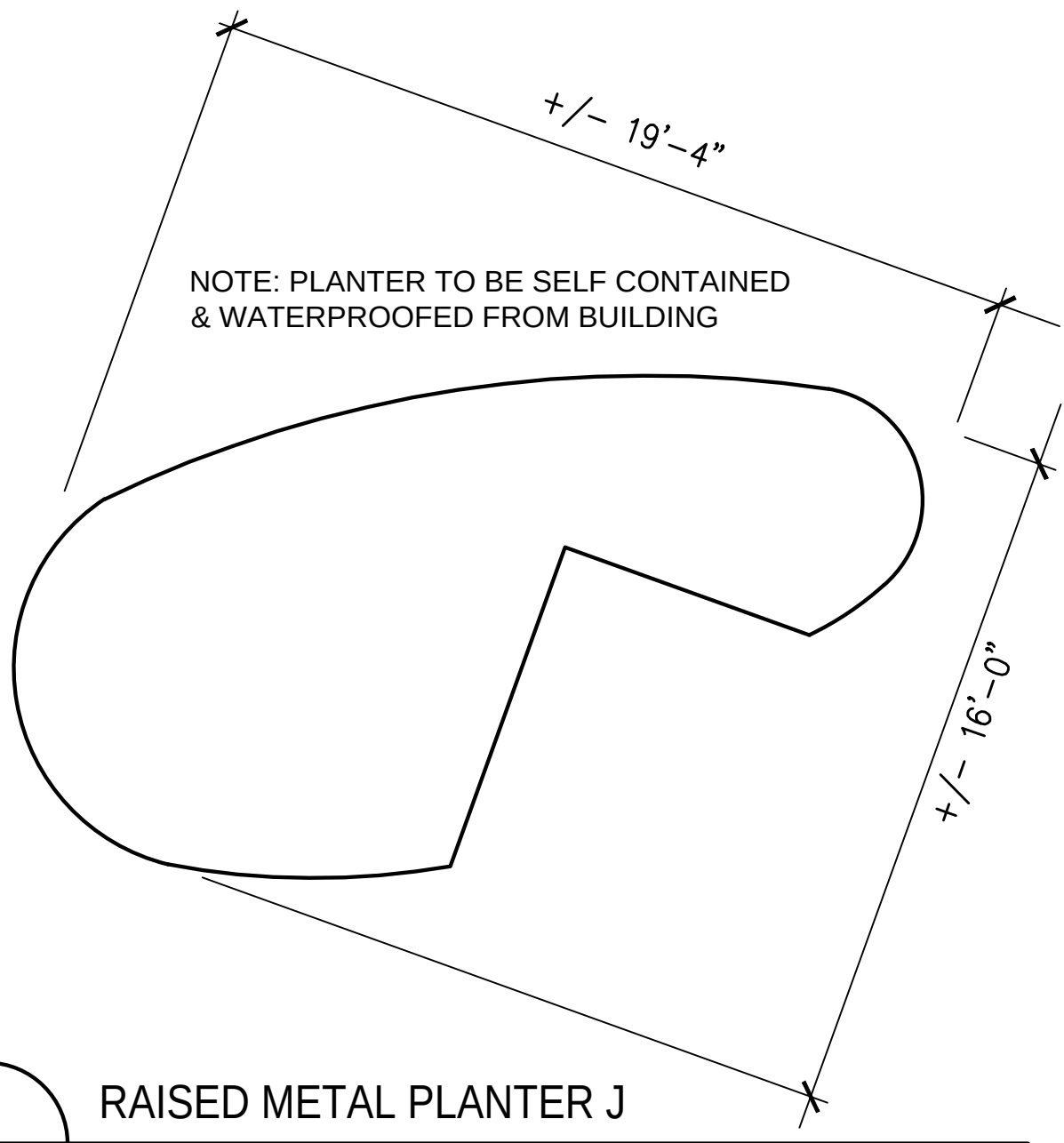
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L303 SCALE: 1" = 4' - 0"



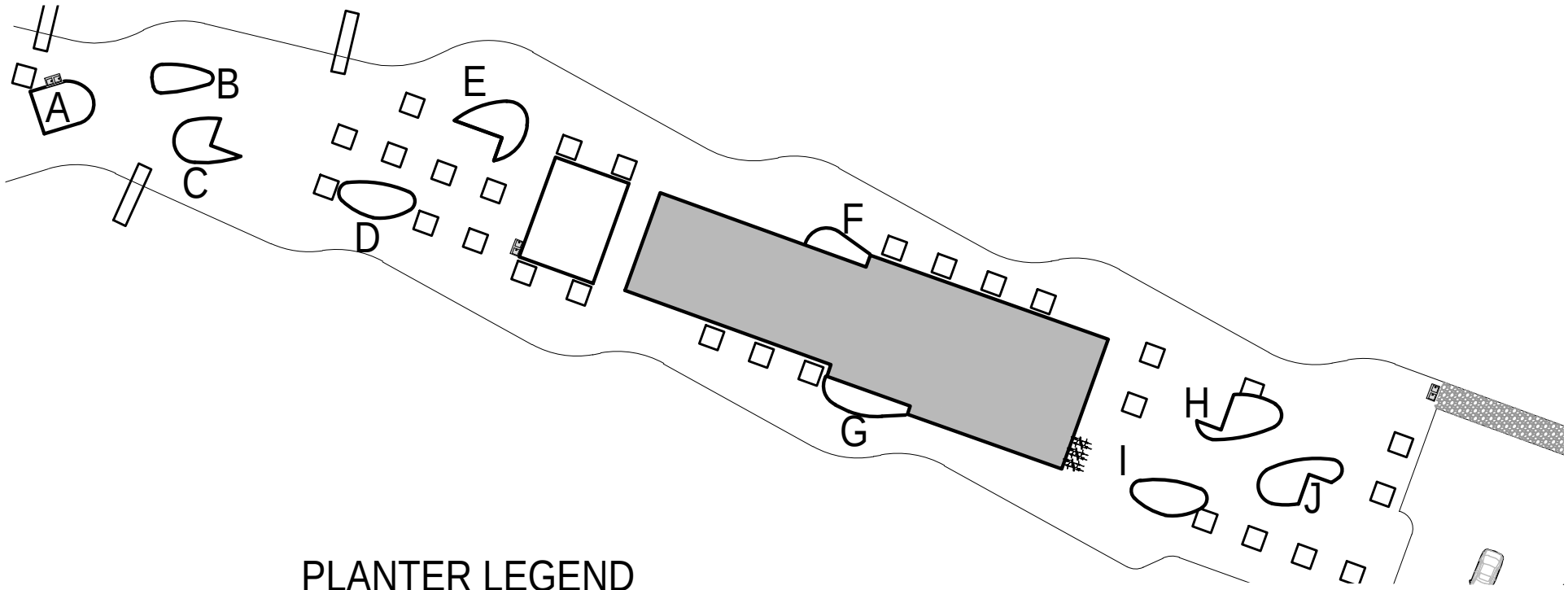
3 RAISED METAL PLANTER I  
L303 SCALE: 1" = 4' - 0"



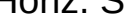
4 RAISED METAL PLANTER H  
L303 SCALE: 1" = 4' - 0"



5 RAISED METAL PLANTER J  
L303 SCALE: 1" = 4' - 0"

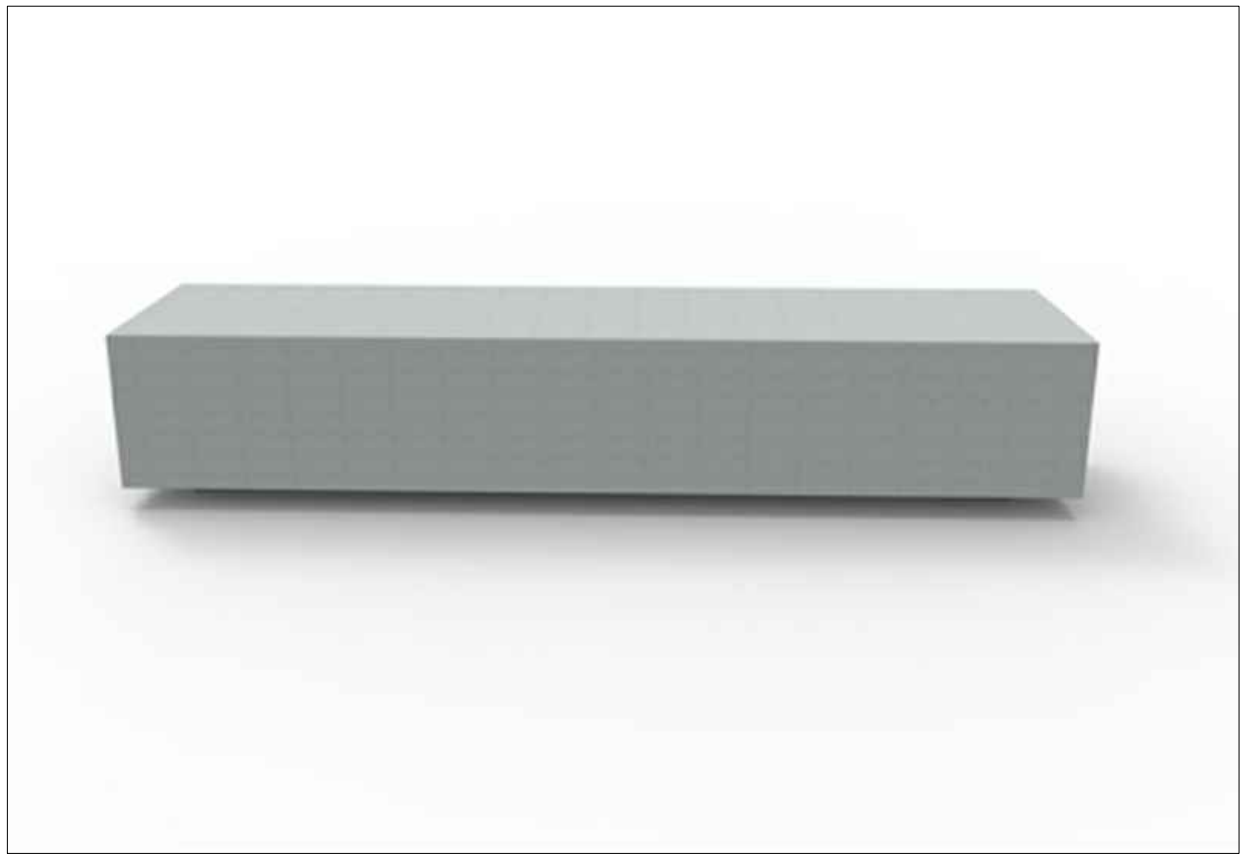


DESIGN INTENT IMAGERY (FINAL FINISH TBD)

|                                                                                                                                                                                                                                                                                                                            |  |                 |          |          |       |                                                                                                                               |  |               |  |                        |                      |                          |                  |  |
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| File Name: 0-23019-DETAILS_Transit.dwg                                                                                                                                                                                                                                                                                     |  | Rev.            | Date     | Comments | Init. |                                                                                                                               |  | No Revisions: |  |                        |                      |                          | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                                          |  | <div></div>     | 09/17/24 | 50% CD   | LW/SH |                                                                                                                               |  | Revised:      |  | Designer: LW           | Structure<br>Numbers | 25924                    |                  |  |
| <div><div> Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>     |          |          |       |                                                                                                                               |  | Void:         |  | Detailer: SH           |                      | Sheet Number <b>L303</b> |                  |  |
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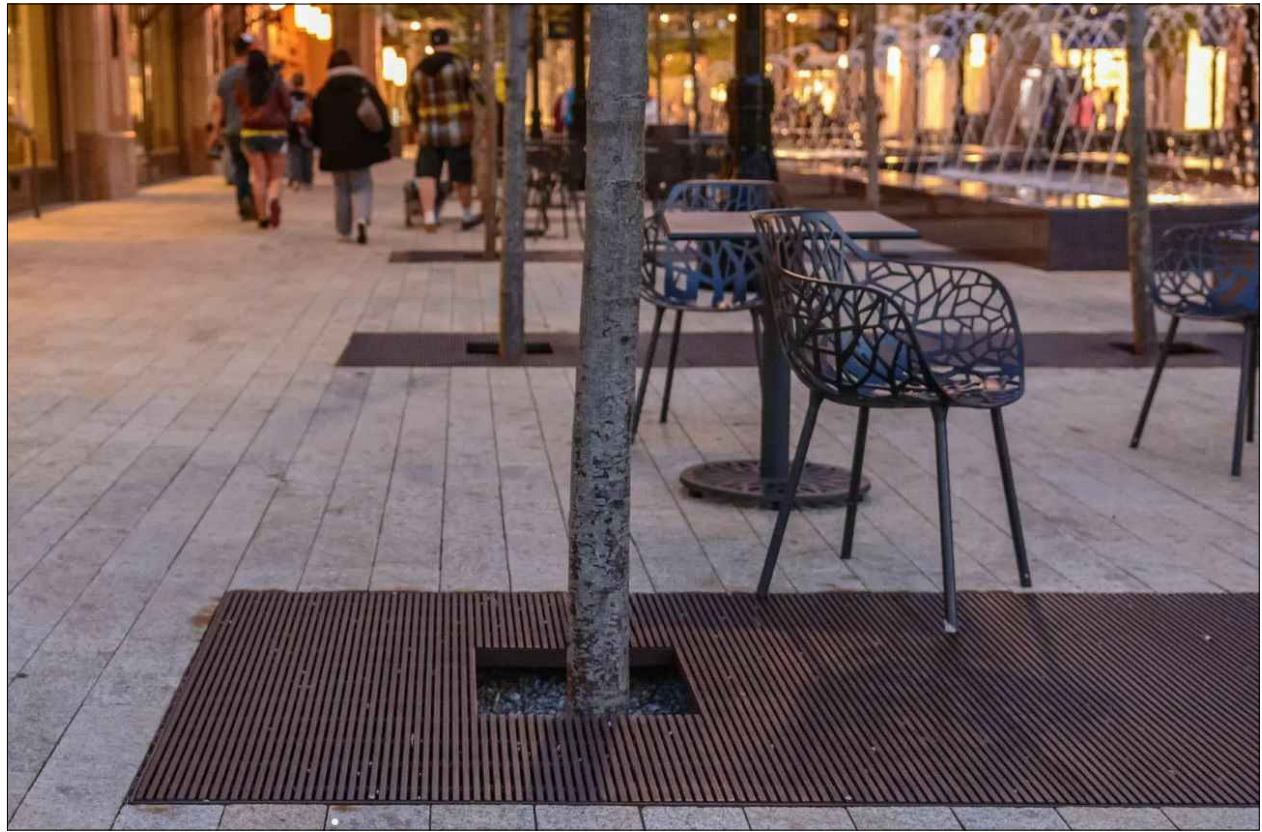




1

BENCH TYPE A

L304LANDSCAPE FORMS SOCRATESSCALE: NTS



2

TREE GRATE W/ TREE PROTECTION

L304URBAN ACCESSORIES JAMESON- TREE GUARD TBDSCALE: NTS



3

BIKE RACK

L304LANDSCAPE FORMS - KEYSCALE: NTS



NOTE: SHOP DRAWINGS TO  
BE PROVIDED AT 100% CD  
SET

4

SCREENING FENCE

L304BOK MODERN - TBD



5

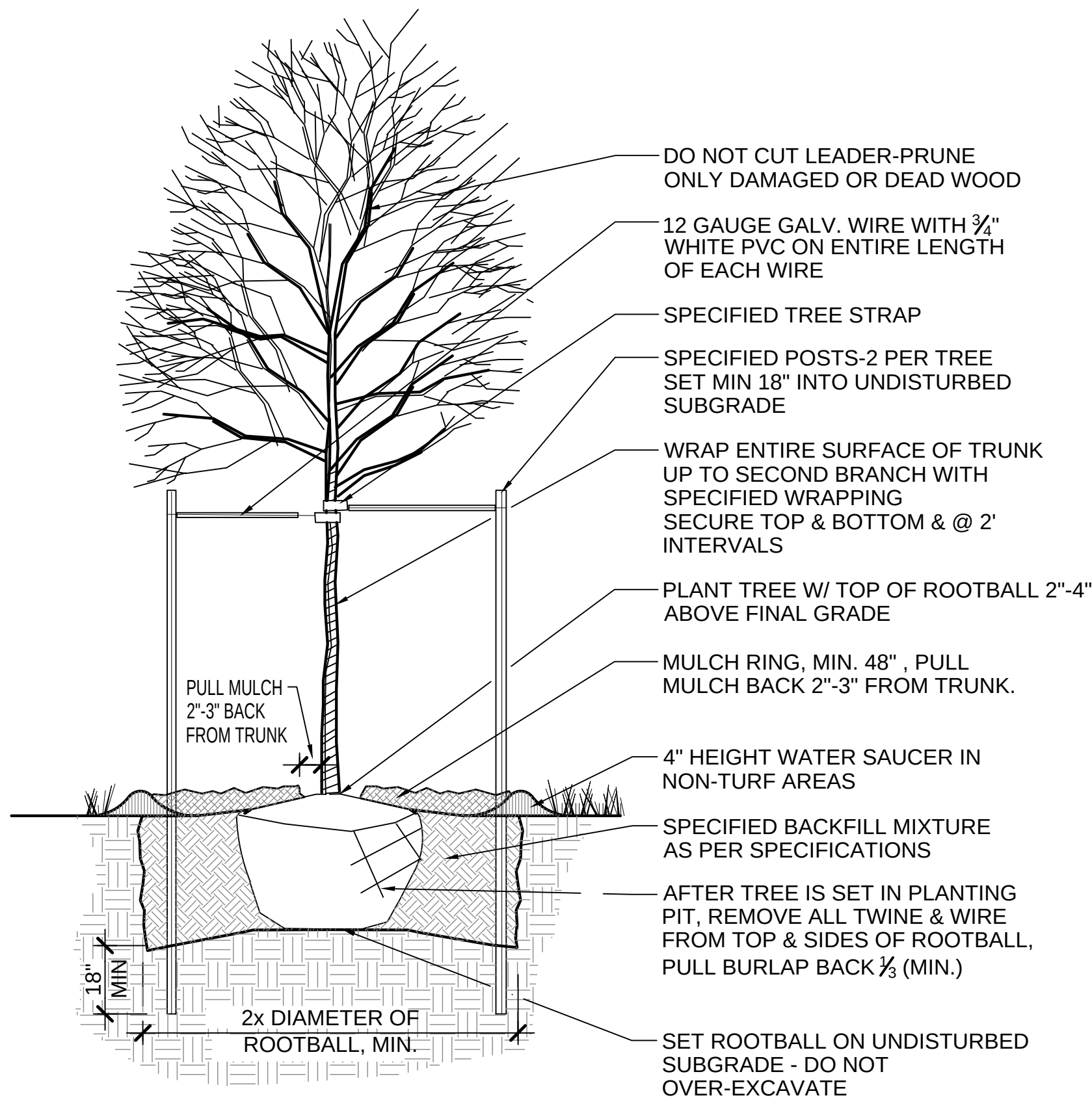
BEAR PROOF TRASH & RECYCLING

L304BEAR SAVER - HA SERIESSCALE: NTS

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| Print Date: 9/17/2024 2:58 PM                                                                                                                                                                                                                                                            |  | Sheet Revisions |            |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br>WEST GLENWOOD TRANSIT CENTER<br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | FIR Plans              |  | SITE<br>DETAILS |           |  |                          | Project No./Code |  |
| File Name: 0-23019-DETAILS_Transit.dwg                                                                                                                                                                                                                                                   |  | Rev.            | Date       | Comments | Init. |                                                                                                                               |  | No Revisions:          |  |                 |           |  |                          | TRG M535-014     |  |
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| <div><div></div><div>Short Elliott Hendrickson Inc.</div><div>Colorado Center Tower One</div><div>Suite 6000</div><div>2000 South Colorado Boulevard</div><div>Denver, CO 80222-7900</div></div> <div>Tele. (720) 540-6800</div> <div>(800) 490-4966</div> <div>Fax (720) 540-6801</div> |  | <div></div>     | SCALE: NTS |          |       |                                                                                                                               |  | Void:                  |  | Detailer: SH    | Numbers   |  | Sheet Number <b>L304</b> |                  |  |
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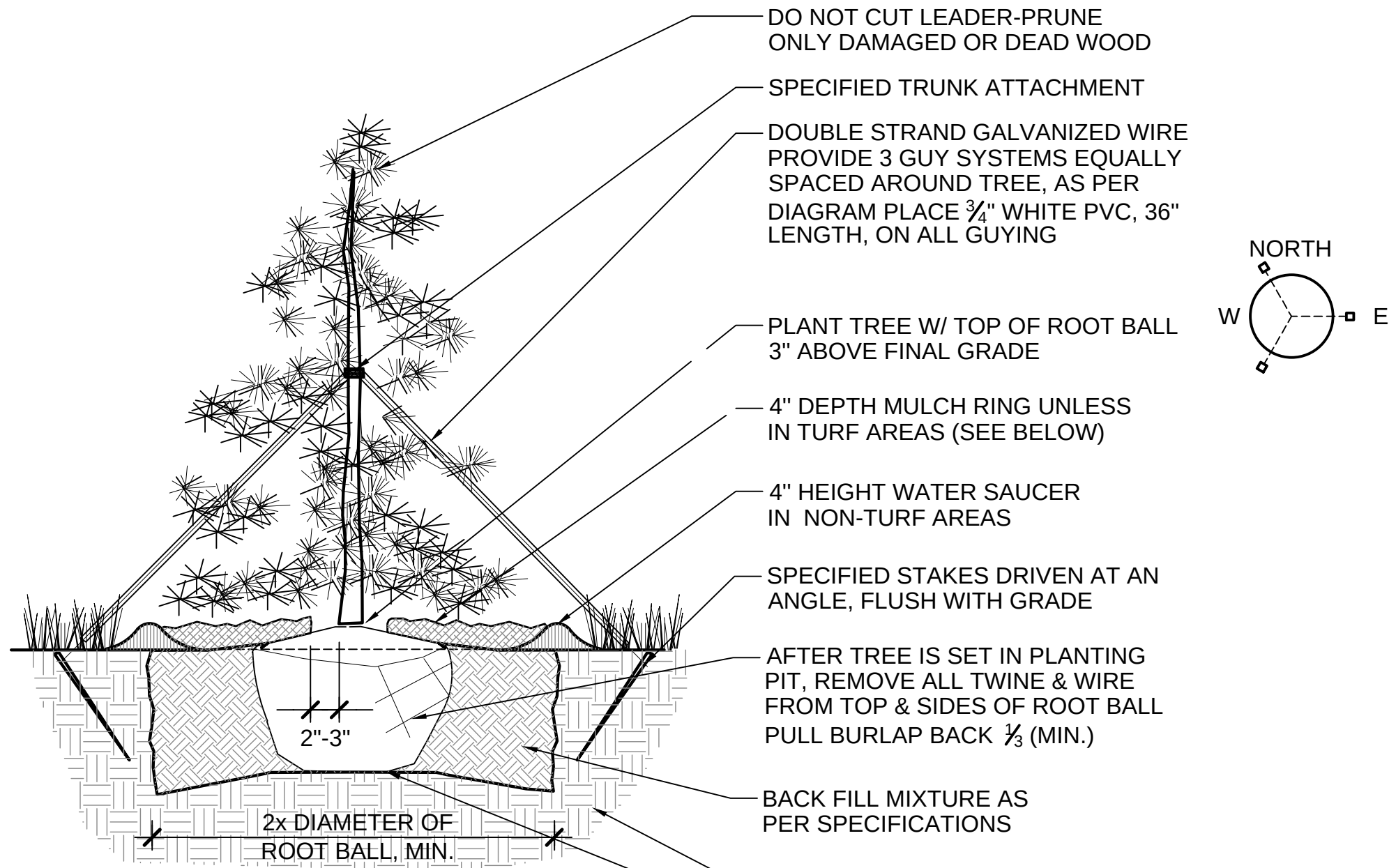




NOTE: MULCH SHOULD BE 4" DEEP IN NON-TURF AREAS, MULCH SHOULD BE 2" DEEP IN TURF AREAS.

## 1 DECIDUOUS TREE PLANTING

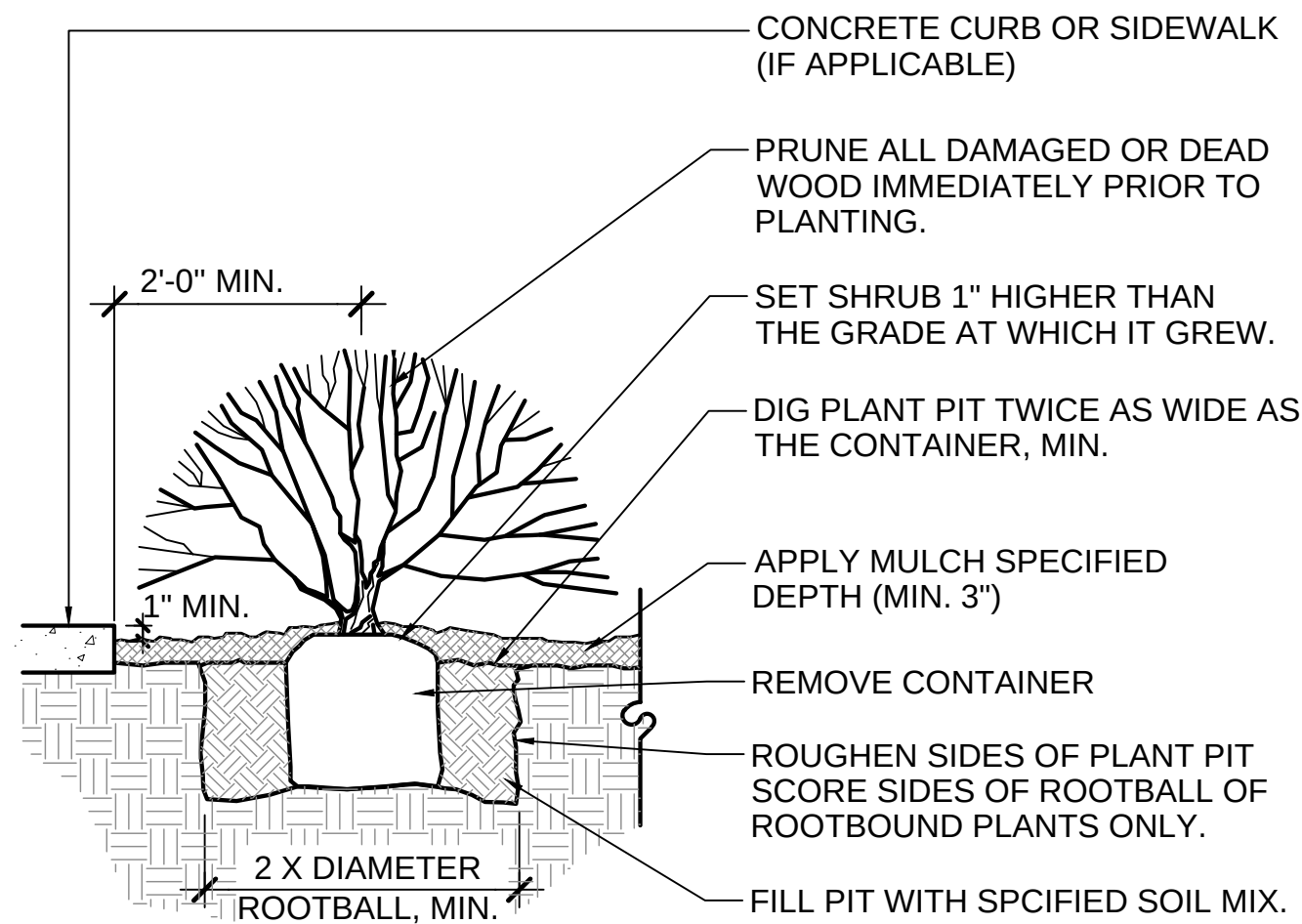
NOT TO SCALE



- NOTES:
- PULL MULCH BACK 2" TO 3" FROM TRUNK OF TREE
  - INSTALL SPECIFIED MULCH TO DRIP LINE OF TREE WHERE PLANTED IN LAWN AREAS. MULCH TO BE 2" DEEP IN LAWN AREAS.
  - DO NOT PROVIDE WATER BASIN IN IRRIGATED LAWN AREAS.

## 2 EVERGREEN TREE PLANTING

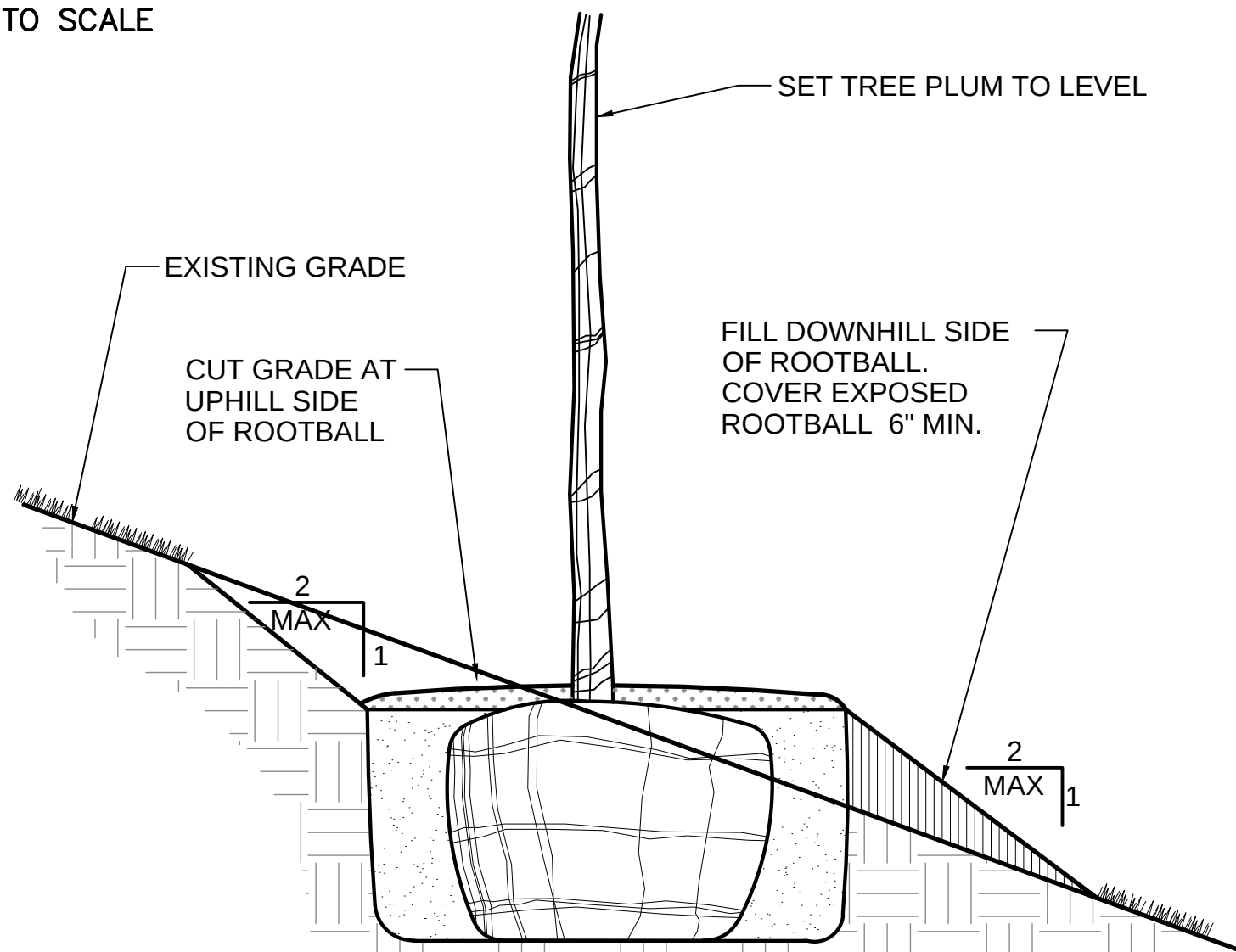
NOT TO SCALE



- NOTES:
- ANY BROKEN OR CRUMBLING ROOTBALLS WILL BE REJECTED.
  - REMOVING THE CONTAINERS WILL NOT BE AN EXCUSE FOR DAMAGED ROOTBALLS.
  - HOLD GRADE 1" BELOW EDGE OF WALK OR CURB

## 4 SHRUB PLANTING

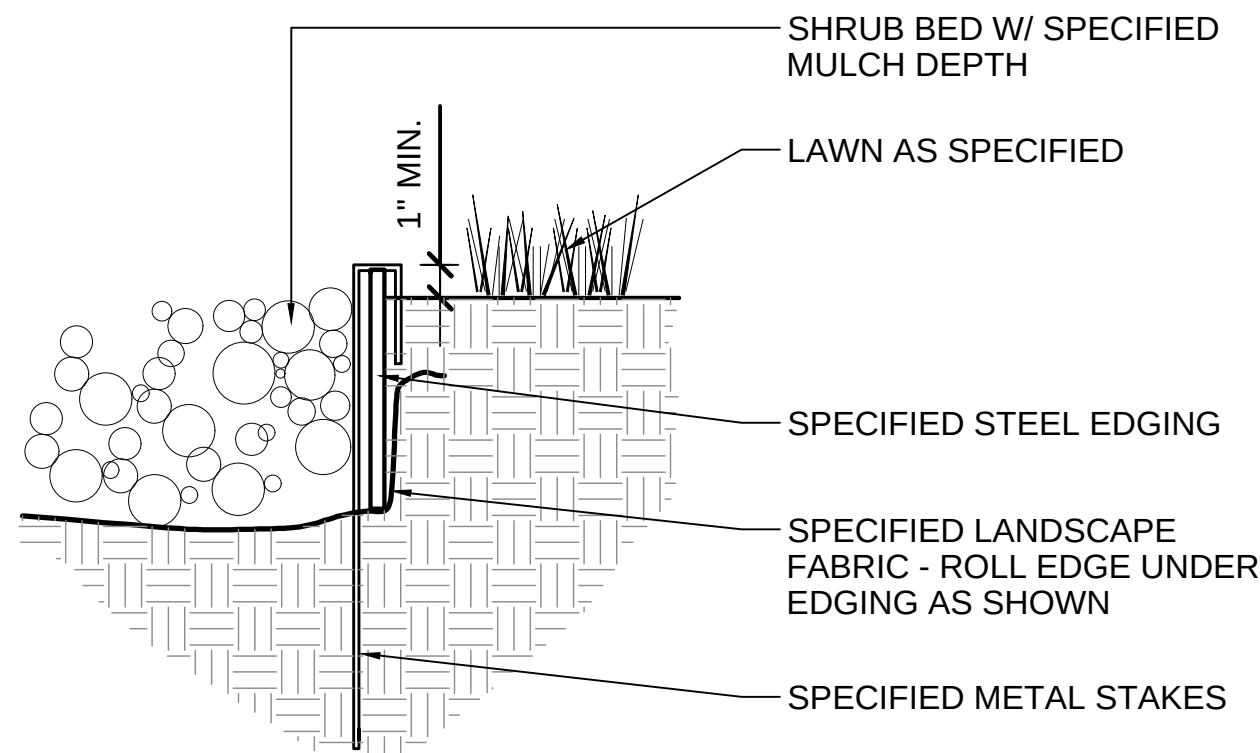
NOT TO SCALE



- NOTES:
- REFER TO VARIOUS SPECIFIC TREE INSTALLATION DETAILS FOR STAKING, GUYING, MULCHING, ETC.
  - THIS INSTALLATION SHALL APPLY TO ALL TREE TYPES AND SIZES PLANTED ON SLOPES LESS THAN 2:1.

## 5 TREE PLANTING ON SLOPE

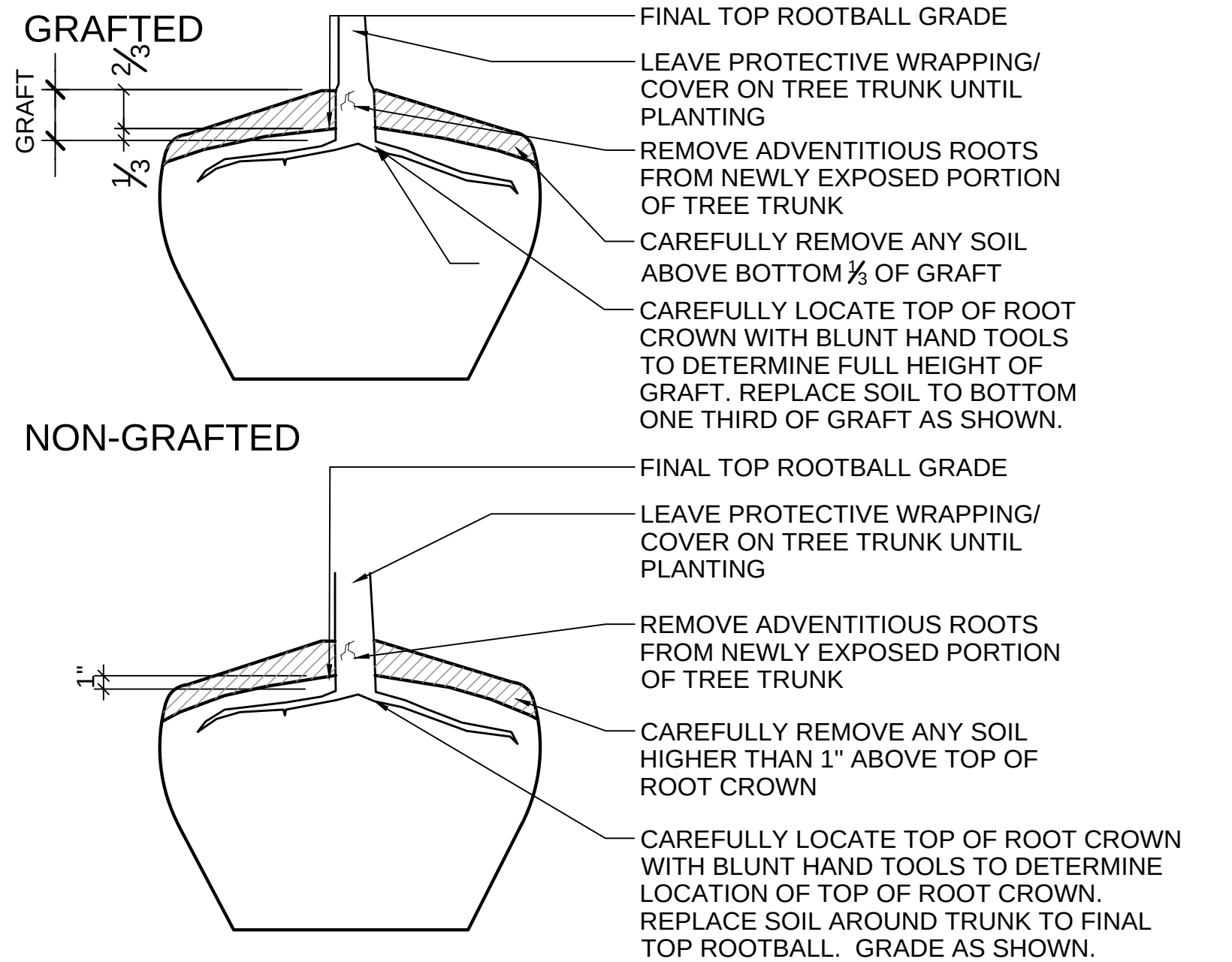
NOT TO SCALE



- NOTES:
- SET ALL EDGING 1" ABOVE FINISH GRADE AS SHOWN.
  - EDGING SHALL ABUT ALL CONCRETE CURBS AND WALKS PERPENDICULAR, AND FLUSH W/ GRADES OF CONCRETE.
  - ALL JOINTS TO BE SECURELY STAKED.

## 7 STEEL EDGER

NOT TO SCALE

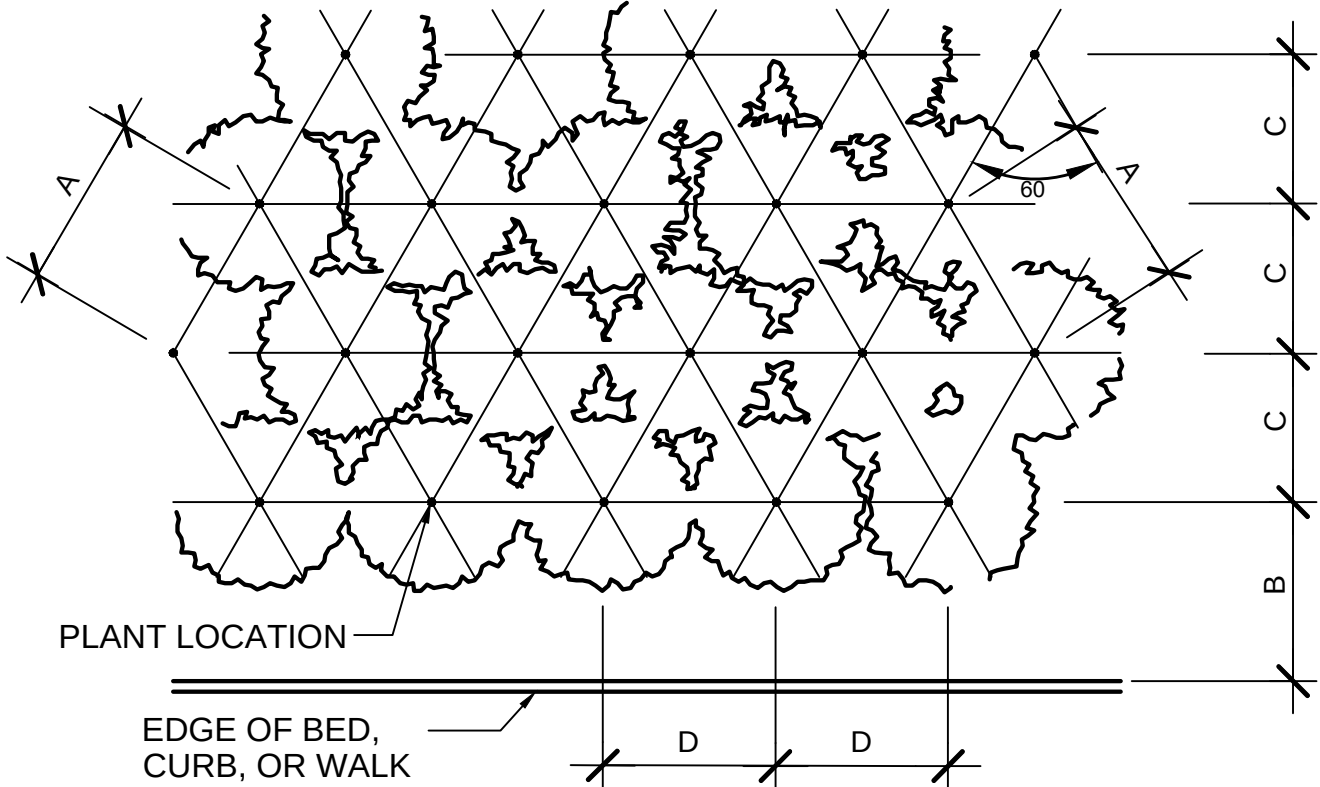


- NOTES:
- ALL WORK TO BE DONE AT TIME OF PLANTING
  - PEEL BACK ONLY TOP OF BURLAP REQUIRED TO PERFORM WORK. REPLACE BURLAP BEFORE MOVING TREE INTO PLANTING PIT. DO NOT REMOVE WIRE BASKET UNTIL INSIDE PLANTING PIT.
  - MEASURE NEW HEIGHT OF ROOTBALL AND DIG PLANTING PIT SO FINAL TOP ROOTBALL GRADE IS 3" ABOVE FINAL GRADE SURROUNDING BALL.

## 3 FINAL TOP ROOTBALL GRADE

NOT TO SCALE

| PLANT SPACING | A   | B   | C   | D   |
|---------------|-----|-----|-----|-----|
| 6"            | 6"  | 6"  | 5"  | 6"  |
| 8"            | 8"  | 6"  | 7"  | 8"  |
| 12"           | 12" | 8"  | 10" | 12" |
| 18"           | 18" | 9"  | 15" | 18" |
| 24"           | 24" | 18" | 21" | 24" |
| 30"           | 30" | 15" | 26" | 30" |
| 36"           | 36" | 30" | 31" | 36" |
| 48"           | 48" | 30" | 42" | 48" |
| 60"           | 60" | 36" | 52" | 60" |



NOTE: ALIGN FRONT ROW PARALLEL TO BED LINE

## 8 SHRUB / FLOWERS / GROUNDCOVERS

TRIANGULAR SPACING NOT TO SCALE

|                                                                                                                                                                                                     |                 |          |          |       |                                       |  |               |               |                   |                   |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|----------|-------|---------------------------------------|--|---------------|---------------|-------------------|-------------------|------------------|
| Print Date: 9/17/2024 2:58 PM                                                                                                                                                                       | Sheet Revisions |          |          |       | ROARING FORK TRANSPORTATION AUTHORITY |  | FIR Plans     |               | SITE DETAILS      |                   | Project No./Code |
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| Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                 |          |          |       | 2307 WULFSOHN ROAD                    |  | Void:         | Detailer: SH  |                   |                   |                  |
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IRRIGATION CONSTRUCTION NOTES

1.

DRAWINGS AND BASE INFORMATION - ALL BASE AND PLANTING INFORMATION HAVE BEEN PROVIDED BY DHM DESIGN. THE CONTRACTOR IS RESPONSIBLE TO NOTIFY HYDROSYSTEMS\*KDI OF ANY DISCREPANCIES BETWEEN THE UTILITY OR PLANTING PLANS AND THE IRRIGATION PLAN. IF CONTRACTOR FAILS TO NOTIFY HYDROSYSTEMS\*KDI AND MAKES CHANGES TO THE IRRIGATION SYSTEM DESIGN, THEY ASSUME ALL COSTS AND LIABILITIES ASSOCIATED WITH THOSE FIELD CHANGES. REFER TO SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. CONTACT IRRIGATION CONSULTANT FOR CURRENT SPECIFICATIONS IF NOT PROVIDED.
2.

SYSTEM PRESSURE - HYDROSYSTEMS\*KDI HAS CONTACTED THE LOCAL WATER DISTRICT THAT SERVES THIS SITE AND THEY HAVE BEEN TOLD THAT THE STATIC WATER PRESSURE IN THIS AREA SHOULD BE 70-74 PSI. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY PRESSURE PRIOR TO COMMENCING ANY CONSTRUCTION AND NOTIFY HYDROSYSTEMS\*KDI OF ANY VARIANCE FROM THE STATED PRESSURE IMMEDIATELY. WRITTEN DOCUMENTATION OF PRESSURE TEST AND RESULTS SHALL BE PROVIDED TO HYDROSYSTEMS\*KDI AT CONSTRUCTION ONSET. IF CONTRACTOR FAILS TO FIELD VERIFY PRESSURE AND/OR NOTIFY HYDROSYSTEMS\*KDI OR ANY VARIATIONS FROM THIS PRESSURE, THEN THEY ASSUME ALL CONSTRUCTION AND ENGINEERING COSTS ASSOCIATED WITH SYSTEM MODIFICATIONS REQUIRED TO ACCOMMODATE ACTUAL SITE PRESSURE. THIS SYSTEM HAS BEEN DESIGNED FOR A REQUIRED STATIC PRESSURE OF 70-74 PSI MINIMUM (AS NOTED AT EACH LOCATION).
3.

IRRIGATION SYSTEM OPERATION INTENT - THIS IRRIGATION SYSTEM HAS BEEN DESIGNED TO IRRIGATE THE ESTABLISHED LANDSCAPE WITHIN A SIX NIGHT PER WEEK, EIGHT HOUR PER NIGHT WATERING WINDOW. ESTABLISHMENT WATERING WILL REQUIRE UP TO TWICE AS MUCH IRRIGATION FOR A FOUR TO SIX WEEK PERIOD. THE DESIGN IS BASED ON THE FOLLOWING PROJECTED WEEKLY APPLICATION RATES AFTER ESTABLISHMENT. THESE FIGURES ARE BASED ON A 30-YEAR AVERAGE WEATHER DATA AND WILL NEED TO BE ADJUSTED DUE TO SEASONAL CHANGES AND WEATHER CONDITIONS ABOVE AND BELOW THE AVERAGE VALUES UTILIZED.

BLUEGRASS TURF1.50" PER WEEK PEAK SEASON

ORNAMENTAL PLANTINGS0.89" PER WEEK PEAK SEASON

NATIVE SEED MIXES0.74" PER WEEK PEAK SEASON (TWO SEASONS)

NOTE: IT IS THE INTENT OF THIS DESIGN THAT NATIVE AREAS WOULD ONLY BE IRRIGATED FOR ESTABLISHMENT. SYSTEM WILL REMAIN FOR USE DURING YEARS WITH LESS THAN NORMAL RAINFALL.
4.

EQUIPMENT INSTALLATION - IT IS THE INTENT OF THIS DESIGN THAT ALL IRRIGATION EQUIPMENT BE INSTALLED WITHIN PROPERTY LIMITS AND WITHIN LANDSCAPED AREAS. INSTALLATION SHALL BE COORDINATED WITH OTHER UTILITY WORK. ALL OTHER UTILITIES SHALL TAKE PRECEDENCE OVER IRRIGATION LOCATION. ANY EQUIPMENT OTHER THAN VALVE BOXES OR SLEEVEING THAT CONTAINS PIPE OR WIRES SHOWN OUTSIDE OF THESE LIMITS IS SHOWN IN THAT LOCATION FOR GRAPHICAL CLARITY ONLY. ALL VALVE BOXES SHALL BE INSTALLED A MINIMUM OF 2'-0" FROM EDGE OF ANY PAVED SURFACES UNLESS SPECIFICALLY INDICATED ON PLANS. BOXES INSTALLED IN OPEN TURF AREAS SHALL BE KEPT TO EDGES AND STAKED FOR REVIEW IF ALONG HIGH TRAFFIC AREAS. ALL VALVE BOXES SHALL BE PLACED A MINIMUM OF 3'-0" FROM THE CENTERLINE OF ANY DRAINAGE SWALE. ALL VALVE BOXES WITHIN PAVEMENT SHALL BE TIER 15 RATED BOXES FOR HEAVY DUTY. NON-DELIBERATE TRAFFIC, BOX LID COLOR SHALL MATCH ADJACENT MATERIALS, I.E. GREEN IN TURF, TAN IN WOOD MULCH, GRAY IN STONE MULCH, PURPLE FOR RECLAIMED WATER SYSTEMS (IF REQUIRED). REFER TO LANDSCAPE PLANS FOR MATERIAL COLORS AND TYPES. ALL BOXES SHALL BE INSTALLED TO BE FLUSH WITH GRADE AND IN AN ORDERLY MANNER. WHERE MORTAR PAVING LIDS ARE INSTALLED ABOVE BOXES, IRRIGATION BOX WITH LID SHALL BE LOWERED TO ACCOMMODATE PAVING LID. REFER TO LANDSCAPE FOR ADDITIONAL INFORMATION, TO BE INSTALLED PER MANUFACTURE RECOMMENDATIONS.
5.

PIPING INSTALLATION - IRRIGATION PIPING SHALL MAINTAIN A MINIMUM DISTANCE FROM BUILDING FOUNDATIONS OF 5 FEET OR AS DESCRIBED IN SOILS REPORT, WHICHEVER IS GREATER. NO SPRAY IRRIGATION SHALL OCCUR WITHIN 10 FEET OF THE FOUNDATION. NO DRIP IRRIGATION SHALL OCCUR WITHIN 5 FEET OF THE FOUNDATION UNLESS SOIL MOISTURE SENSORS ARE INSTALLED ON VALVES SERVICING THESE AREAS. ALL IRRIGATION PIPING AND EMISSION DEVICES LOCATED ON TOP OF OR WITHIN BUILDING STRUCTURE SHALL CONFORM TO WATERPROOFING CONSULTANT REQUIREMENTS. PIPE ROUTING MAY BE SHOWN WITHIN THESE DISTANCES FOR GRAPHICAL CLARITY ONLY.
6.

MANUAL DRAIN VALVES - CONTRACTOR TO INSTALL ONE MANUAL DRAIN VALVE AT ALL LOW POINTS AND DEAD ENDS OF PRESSURE SUPPLY PIPING TO ENSURE COMPLETE DRAINAGE OF SYSTEM. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THESE LOCATIONS IN-FIELD AND INSTALLATION LOCATIONS SHALL BE NOTED ON AS-BUILTS.
7.

POP-UP SPRAY NOZZLES - CONTRACTOR TO INSTALL PLASTIC NOZZLES ON ALL POP-UP SPRAY HEADS. INSTALL 15 SERIES NOZZLES ON ALL HEADS SPACED AT 12' TO 14'. INSTALL 12 SERIES NOZZLES ON ALL HEADS SPACED 10' TO 11'. INSTALL 10 SERIES NOZZLES ON ALL HEADS SPACED AT 8' TO 9'. INSTALL 8 SERIES NOZZLES ON ALL HEADS SPACED AT 6' TO 7'. INSTALL 5' NOZZLES ON ALL HEADS SPACED AT 5'. INSTALL SIDE STRIP NOZZLES ON ALL HEADS WITH AN 'S' DESIGNATION AND RIGHT AND LEFT CORNER STRIP NOZZLES ON ALL HEADS WITH AN 'L' OR 'R' DESIGNATION. VARIABLE ARC NOZZLES SHOULD BE UTILIZED ADJACENT TO CURVILINEAR SHRUB BEDS OR FOR ANY ANGLES THAT ARE NOT A STANDARD NOZZLE ANGLE.
8.

UNLABELED PIPING - ALL UNLABELED LATERAL PIPING SHALL BE 1" MINIMUM UNLESS OTHERWISE NOTED.
9.

SLEEVEING - ALL SLEEVEING UNDER PAVED SURFACES SHOWN ON PLANS IS BY CONTRACTOR UNLESS OTHERWISE NOTED. SLEEVEING SHALL BE INSTALLED IN THE SIZES AND QUANTITIES SHOWN ON PLANS OR BASED ON THE SCHEDULE BELOW. WHERE SLEEVES ARE SHOWN, BUT NOT LABELED, FOLLOW THE SCHEDULE BELOW. ALL MAINLINE, CONTROL WIRES AND DRIP LINES UNDER PAVED SURFACES ARE TO BE INSTALLED IN SLEEVEING. ALL MAINLINE SLEEVE LOCATIONS TO INCLUDE A SEPARATE WIRE SLEEVE.

SLEEVED PIPE SIZE/WIRE QUANTITY

REQUIRED SLEEVE SIZE & (QUANTITY)

3/4" - 1 1/4" PIPING2" PVC (1)

1 1/2" - 2" PIPING4" PVC (1)

2 1/2" - 3" PIPING6" PVC (1)

2-WIRE CABLE2" PVC (1)

10.

2-WIRE SYSTEM NOTES - CONTRACTOR SHALL INSTALL ALL TWO-WIRE COMPONENTS PER MANUFACTURER'S RECOMMENDATIONS AND STANDARDS.

10.1. CONTRACTOR SHALL USE ONLY MANUFACTURED 2-WIRE DECODER CABLE (SEE SCHEDULE FOR SPECIFIC 2-WIRE CABLE).

10.2. ONLY USE SINGLE STATION DECODERS (SEE SCHEDULE FOR SPECIFIC MODEL).

10.3. LOOP 5' OF 2-WIRE DECODER CABLE INTO ALL VALVE BOXES (WITH DECODERS AND SPLICES) FOR MAINTENANCE.

10.4. LOOP 2' OF 2-WIRE DECODER CABLE AS AN EXPANSION LOOP AT ALL CHANGES OF DIRECTION.

10.5. USE ONLY 3M DBR-6 WATERPROOF CONNECTORS ON ALL WIRE SPLICES AND ALL WIRE SPLICES ARE TO BE MADE WITHIN A VALVE BOX WITH CONTROL VALVES OR A SEPARATE 10" ROUND VALVE BOX FOR WIRE SPLICES.

10.6. INSTALL SURGE PROTECTOR RODS OR PLATES & LF. PERPENDICULARLY FROM VALVES, DECODERS, AND COMMUNICATION WIRE. WHERE & LF IS NOT AVAILABLE, REFER TO ASIC GUIDELINES FOR PLATE LAYOUT.

10.7. GROUNDING SHALL BE IN AN IRRIGATED AREA.

10.8. GROUND ALL DECODERS AND DECODER WIRE A MINIMUM OF EVERY 600' AND AT ALL ENDS OF 2-WIRE DECODER CABLE RUN.

11.

ADJUSTMENT - CONTRACTOR SHALL FINE TUNE/ADJUST THE IRRIGATION SYSTEM TO REDUCE/AVOID OVERSPRAY ONTO HARD SURFACES BY ADJUSTING NOZZLE DIRECTION AND NOZZLE RADIUS.

12.

PLANS AND SPECIFICATIONS - CONTRACTOR RESPONSIBLE TO ENSURE WORK CONFORMS TO PLANS AND SPECIFICATIONS. AT ONSET OF CONSTRUCTION, VERIFY PLANS ARE CURRENT. DO NOT CONSTRUCT ANY PORTIONS OF THE IRRIGATION OFF OF PLANS MARKED NOT FOR CONSTRUCTION OR FOR REVIEW ONLY. FAILURE TO VERIFY CURRENT PLANS MAY RESULT IN RECONSTRUCTION AT CONTRACTOR'S EXPENSE. WHERE REQUIRED BY CITY OR TOWN, CONTRACTOR SHALL CONSTRUCT ONLY OFF CITY OR TOWN STAMPED PLANS. REVISIONS TO CITY OR TOWN STAMPED PLANS SHALL CONFORM TO CITY OR TOWN FIELD CHANGE PROCEDURES AND DOCUMENTATION.

13.

EXISTING IRRIGATION DAMAGE - CONTRACTOR SHALL REPAIR OR REPLACE ANY EXISTING IRRIGATION SYSTEMS DAMAGED DURING NEW INSTALLATION. REPAIR OR REPLACEMENT SHALL BE DETERMINED BY OWNER OR OWNER'S REPRESENTATIVE AND PAID FOR BY THE LANDSCAPE CONTRACTOR.

14.

EXISTING IRRIGATION COORDINATION - EXISTING IRRIGATION SYSTEM SHALL NOT BE TURNED OFF FOR MORE THAN 24 HOURS MAXIMUM. CONTRACTOR SHALL COORDINATE TURN OFF OF SYSTEM WITH OWNER OR MAINTENANCE STAFF 72 HOURS PRIOR TO ANY NEW CONSTRUCTION.

15.

SIMULTANEOUS ZONE OPERATION - THIS IRRIGATION SYSTEM HAS BEEN DESIGNED TO OPERATE MULTIPLE ZONES SIMULTANEOUSLY BASED ON INDIVIDUAL ZONE FLOW. THE DESIGN IS INTENDED TO OPERATE MULTIPLE VALVES, UP TO THE MAXIMUM FLOW IN THE POINT OF CONNECTION NOTE. REFER TO CONTROLLER SPECIFICATION FOR MAXIMUM SIMULTANEOUS VALVE COUNT.

16.

WATER BUDGETS AND PROJECTIONS - HYDROSYSTEMS-KDI HAS BASED THE IRRIGATION DESIGN AND THE ASSOCIATED PROJECTED WATER USE UPON SUCH FACTORS AS CITY OR WATER DISTRICT IMPOSED REQUIREMENTS, PUBLISHED PLANT SPECIES WATER NEEDS, SELECTED IRRIGATION METHOD EFFICIENCIES AS REPORTED BY INDEPENDENT TESTING FACILITIES, HISTORICAL WEATHER DATA FOR THE PROJECT LOCATION, AND PROPER MAINTENANCE PROCEDURES. HYDROSYSTEMS\*KDI IS NOT RESPONSIBLE, AND ACCEPTS NO RESPONSIBILITY, FOR THE ACTUAL WATER USAGE VARIATION THAT IS A RESULT OF FIELD MODIFICATIONS TO THE SYSTEM NOT MATCHING CONSTRUCTION DOCUMENTS, IMPROPER MAINTENANCE, WASTE DUE TO SYSTEM DAMAGE OR VANDALISM, OR WEATHER CONDITIONS THAT DEVIATE FROM PUBLISHED 30 YEAR HISTORICAL AVERAGES.

DIRECTORY

IRRIGATION NOTES & SCHEDULE  
IRRIGATION PLANS  
IRRIGATION DETAILS  
IRRIGATION CHARTS

IR.1

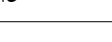
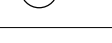
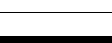
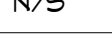
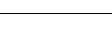
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| Print Date: 6/27/2024 11:08 AM                                                                                                                                                                                          | Sheet Revisions       |      |          |       | ROARING FORK TRANSPORTATION AUTHORITY            |  | FIR Plans     |                     | IRRIGATION NOTES & SCHEDULE |    |              | Project No./Code |  |  |  |
| File Name: 0-23019-IRRIGATION_TRANSIT.dwg                                                                                                                                                                               | Rev.                  | Date | Comments | Init. | WEST GLENWOOD TRANSIT CENTER                     |  |               |                     |                             |    |              | TRG M535-014     |  |  |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                  | Vert. Scale: As Noted |      |          |       |                                                  |  | No Revisions: |                     |                             |    |              |                  |  |  |  |
|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900 |                       |      |          |       | 2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 |  | Revised:      | Designer: KJD       | Structure Numbers           |    | 25924        |                  |  |  |  |
|                                                                                                                                                                                                                         |                       |      |          |       |                                                  |  | Void:         | Detailer: JSB       |                             |    |              |                  |  |  |  |
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IRRIGATION SCHEDULE

| SYMBOL                                                                                | MANUFACTURER       | MODEL NO.                                                                                        | DESCRIPTION                                | DETAIL NO.               |
|---------------------------------------------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|
|    | RAIN BIRD          | RD-06-S-P30 WITH "MFR" FIXED SPRAY NOZZLES (OR APPROVED EQUAL)                                   | POPOP SPRAY HEAD                           | 9                        |
|    | RAIN BIRD          | RD-12-S-P30 WITH "MFR" FIXED SPRAY NOZZLES (OR APPROVED EQUAL)                                   | HI-POP SPRAY HEAD                          | 10                       |
|    | RAIN BIRD          | 5006-PL-PC-SAM-R-NP WITH #NOZZLE (6" USE PC AS REVERSING FC)                                     | GEAR DRIVEN ROTOR                          | 11                       |
|    | RAIN BIRD          | 5012-PL-PC-SAM-R-NP WITH #NOZZLE (12" USE PC AS REVERSING FC)                                    | HI-POP GEAR DRIVEN ROTOR                   | 12                       |
|    | RAIN BIRD          | 1402                                                                                             | BUBBLER                                    | 13                       |
|    | RAIN BIRD          | PEB SERIES (OR APPROVED EQUAL)                                                                   | ELECTRIC CONTROL VALVE                     | 8                        |
|    | RAIN BIRD          | 44-LRC (OR APPROVED EQUAL)                                                                       | QUICK COUPLING VALVE                       | 5                        |
| N/S                                                                                   | OLDCASTLE / CARSON | REFER TO SPECIFICATIONS AND DETAILS (OR APPROVED EQUAL)                                          | VALVE BOXES                                | VARIOUS                  |
| N/S                                                                                   | AY MACDONALD       | 76001 - 1/4 TURN - 1" (OR APPROVED EQUAL)                                                        | MANUAL DRAIN VALVE                         | 6                        |
|    |                    | LINE SIZE - 2 1/2" AND SMALLER                                                                   | GATE VALVE                                 | 7                        |
|    | RAIN BIRD          | PEB (1.5") (OR APPROVED EQUAL)                                                                   | MASTER CONTROL VALVE                       | 3                        |
|    | BASELINE           | BL-PFS100 (1.5") (OR APPROVED EQUAL)                                                             | FLOW SENSOR                                | 4                        |
|    |                    | CLASS 200 BE - 2 1/2" & SMALLER                                                                  | PVC MAINLINE                               | 1                        |
|    |                    | CLASS 200 BE                                                                                     | PVC LATERAL                                | 1                        |
|    |                    | CLASS 200                                                                                        | PVC SLEEVEING                              | 2                        |
|    |                    |                                                                                                  | WIRE SPLICES                               | 17                       |
|    | RAIN BIRD          | XCZ-100-PRB-COM                                                                                  | DRIP VALVE ASSEMBLY                        | 14                       |
|    | TORO               | BLUE STRIPE                                                                                      | POLY DRIP TUBING -3/4" MIN. WIDTH          | 15                       |
| N/S                                                                                   | RAIN BIRD          | XBCV - XERI-BUG WITH CHECK VALVE                                                                 | DRIP EMITTERS                              | 15                       |
|    | HUNTER / NIBCO     | ECO-ID-12-R WITH NIBCO BALL VALVE                                                                | DRIP LINE BLOW-OUT STUB AND INDICATOR HEAD | 16                       |
|    |                    | (TO BE REUSED)                                                                                   | EXISTING CONTROLLER                        | N/S                      |
|  |                    | (TO BE REUSED)                                                                                   | EXISTING BACKFLOW DEVICE                   | N/S                      |
|  |                    |                                                                                                  | EXISTING METER                             | N/S                      |
|   |                    |                                                                                                  |                                            | CONTROLLER & STATION NO. |
|  |                    |                                                                                                  |                                            | CONTROL VALVE SIZE       |
|  |                    | NUMBER OF SPARE WIRES - 2 CONTROL AND 1 SPARE WIRES TO WHICH CONTROLLER - SEE CONSTRUCTION NOTES |                                            |                          |

IRRIGATION DEVELOPMENT DESIGN NOTES

1.

THE IRRIGATION SYSTEM SHALL BE DESIGNED TO PROVIDE PEAK SEASON IRRIGATION WITHIN AN SIX NIGHT, SIX HOUR PER NIGHT WATERING PERIOD. IRRIGATION SHALL OCCUR BETWEEN THE HOURS OF 10:00 PM AND 4:00 AM.

2.

THE MAINLINE SYSTEM WILL BE DESIGNED SUCH THAT VELOCITIES WITHIN THE MAINLINE PIPING DO NOT EXCEED FIVE FEET PER SECOND.

3.

THE MAXIMUM FLOW RATE REQUIRED FOR THE SITE IS (TBD) GPM. THE STATIC PRESSURE AVAILABLE AT THE SITE IS (TBC) PSI

4.

THE IRRIGATION INFORMATION SHOWN ON THESE PLANS IS CONCEPTUAL.

5.

IRRIGATION DESIGN APPROACH

5.1. NATIVE AREAS

5.1.1. SMALL AREAS (25 FEET WIDE OR LESS) SHALL BE IRRIGATED WITH FIXED NOZZLE POP-UP SPRAY HEADS (12" HEIGHT) WITH MATCHED PRECIPITATION NOZZLES. NOZZLES SHALL BE SIZES TO PROVIDE HEAD TO HEAD COVERAGE.

5.1.2. LARGE TURF AREAS (WIDER THAN 25 FEET) SHALL BE IRRIGATED WITH GEAR DRIVEN ROTOR HEADS (12" HEIGHT) WITH A MINIMUM PRECIPITATION RATE OF .45" PER HOUR FOR A FULL CIRCLE HEAD.

5.2. SHRUB BED AREAS - BED AREAS WITH PLANT MATERIAL ONE GALLON IN SIZE OR LARGER SHALL BE DRIP IRRIGATED.

5.3. TREES (IN NATIVE AREAS) - SHALL BE SPRAY IRRIGATED WITH 12" POP-UP SPRAY HEADS WITH A BUBBLER NOZZLE (2 PER TREE).

6.

IRRIGATION SYSTEM SHALL BE FULLY AUTOMATIC AND INCLUDE A WEATHER SENSING DEVICE.

IRRIGATION DESIGN STRATEGY

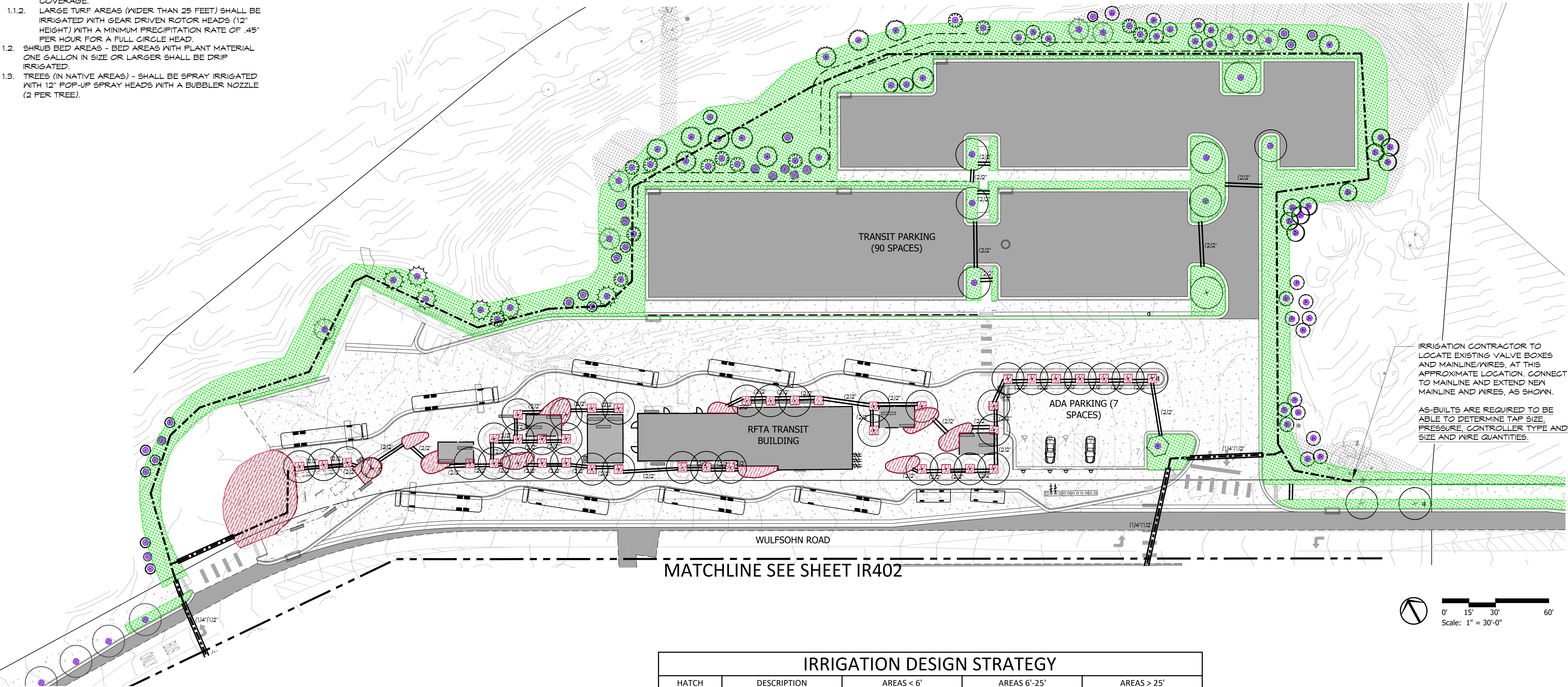
| HATCH                                                                                                                                               | DESCRIPTION       | AREAS < 6'        | AREAS 6'-25'      | AREAS > 25'       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|
|                                                                | NATIVE GRASS      | N/A               | 12" POPUP SPRAY   | 12" ROTOR         |
|                                                                | TREES & SHRUBS    | POINT SOURCE DRIP | POINT SOURCE DRIP | POINT SOURCE DRIP |
|                                                                | TREES (IN NATIVE) | BUBBLER           | N/A               | N/A               |
| *SELECTION OF POINT SOURCE DRIP OR INLINE SUBSURFACE DRIP MAY BE DETERMINED BY PLANT DENSITY, GROWTH HABIT OR LOCATION RATHER THAN AREA DIMENSIONS. |                   |                   |                   |                   |

Packet Page 501



DESIGN INTENT

1. IRRIGATION DESIGN APPROACH
- 1.1. NATIVE AREAS
- 1.1.1. SMALL AREAS (25 FEET WIDE OR LESS) SHALL BE IRRIGATED WITH FIXED NOZZLE POP-UP SPRAY HEADS (12" HEIGHT) WITH MATCHED PRECIPITATION NOZZLES. NOZZLES SHALL BE SIZES TO PROVIDE HEAD TO HEAD COVERAGE.
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- 1.2. SHRUB BED AREAS - BED AREAS WITH PLANT MATERIAL ONE GALLON IN SIZE OR LARGER SHALL BE DRIP IRRIGATED.
- 1.3. TREES (IN NATIVE AREAS) - SHALL BE SPRAY IRRIGATED WITH 12" POP-UP SPRAY HEADS WITH A BUBBLER NOZZLE (2 PER TREE).



IRRIGATION CONTRACTOR TO LOCATE EXISTING VALVE BOXES AND MAINLINE WIRES, AT THIS APPROXIMATE LOCATION. CONNECT TO MAINLINE AND EXTEND NEW MAINLINE AND WIRES, AS SHOWN.

AS-BUILTS ARE REQUIRED TO BE ABLE TO DETERMINE TAP SIZE, PRESSURE, CONTROLLER TYPE AND SIZE AND WIRE QUANTITIES.

DIRECTORY  
IRRIGATION NOTES & SCHEDULE  
IRRIGATION PLANS  
IRRIGATION DETAILS  
IRRIGATION CHARTS

IR.1  
IR.2 - IR.5  
IR.6 - IR.8  
IR.8 - IR.10



| IRRIGATION DESIGN STRATEGY                                                                                                                          |                   |                   |                   |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|
| HATCH                                                                                                                                               | DESCRIPTION       | AREAS < 6'        | AREAS 6'-25'      | AREAS > 25'       |
|                                                                                                                                                     | NATIVE GRASS      | N/A               | 12" POPUP SPRAY   | 12" ROTOR         |
|                                                                                                                                                     | TREES & SHRUBS    | POINT SOURCE DRIP | POINT SOURCE DRIP | POINT SOURCE DRIP |
|                                                                                                                                                     | TREES (IN NATIVE) | BUBBLER           | N/A               | N/A               |
| *SELECTION OF POINT SOURCE DRIP OR INLINE SUBSURFACE DRIP MAY BE DETERMINED BY PLANT DENSITY, GROWTH HABIT OR LOCATION RATHER THAN AREA DIMENSIONS. |                   |                   |                   |                   |



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| Sheet Revisions      |      |          |       |  |
|----------------------|------|----------|-------|--|
| Rev.                 | Date | Comments | Init. |  |
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| <input type="text"/> |      |          |       |  |

ROARING FORK TRANSPORTATION AUTHORITY

WEST GLENWOOD TRANSIT CENTER

2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

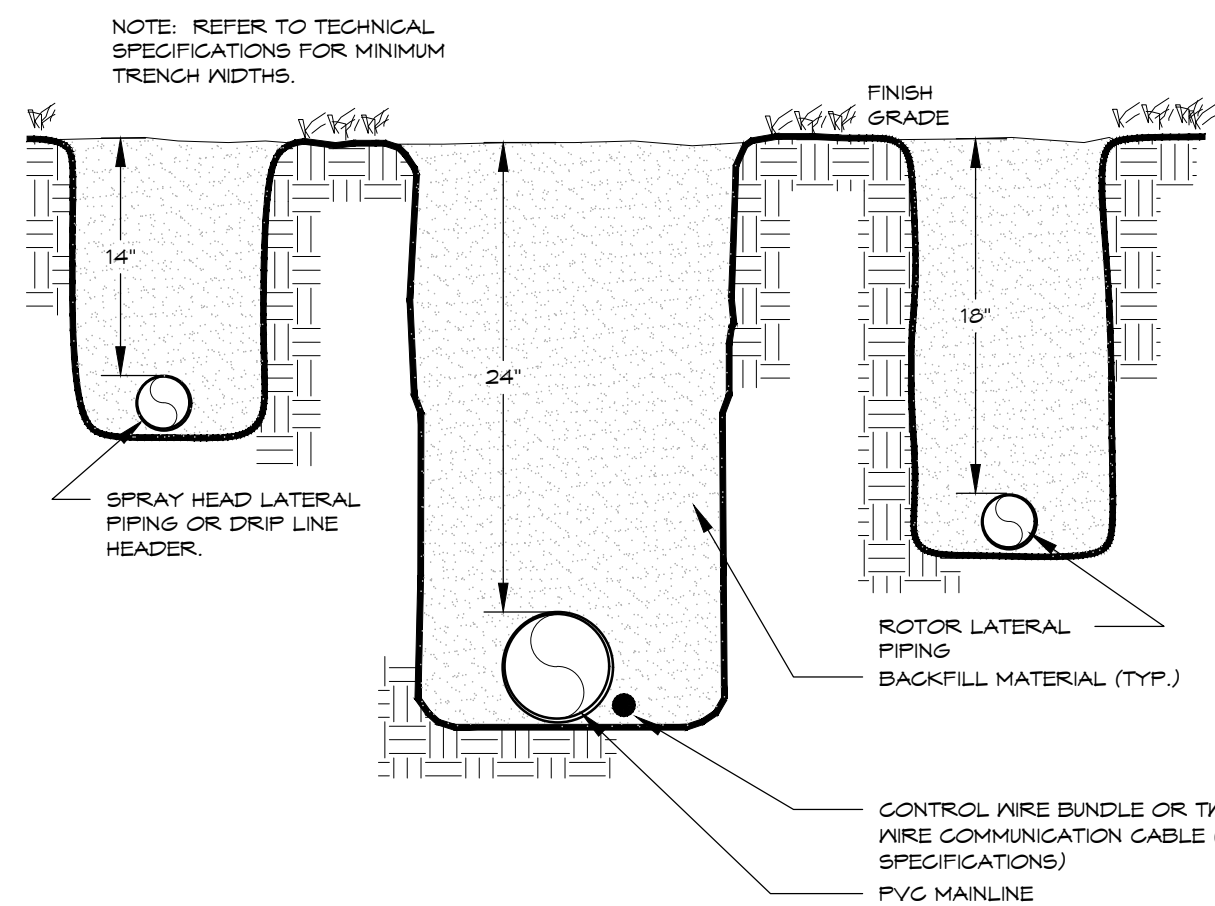
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|---------------|
| No Revisions: |
| Revised:      |
| Void:         |

| IRRIGATION PLAN |       |                   |    |
|-----------------|-------|-------------------|----|
| Designer:       | KJD   | Structure Numbers |    |
| Detailer:       | JSB   |                   |    |
| Sheet Subset:   | IR401 | Subset Sheets:    | of |

| Project No./Code |
|------------------|
| TRG M535-014     |
| 25924            |
| Sheet Number     |

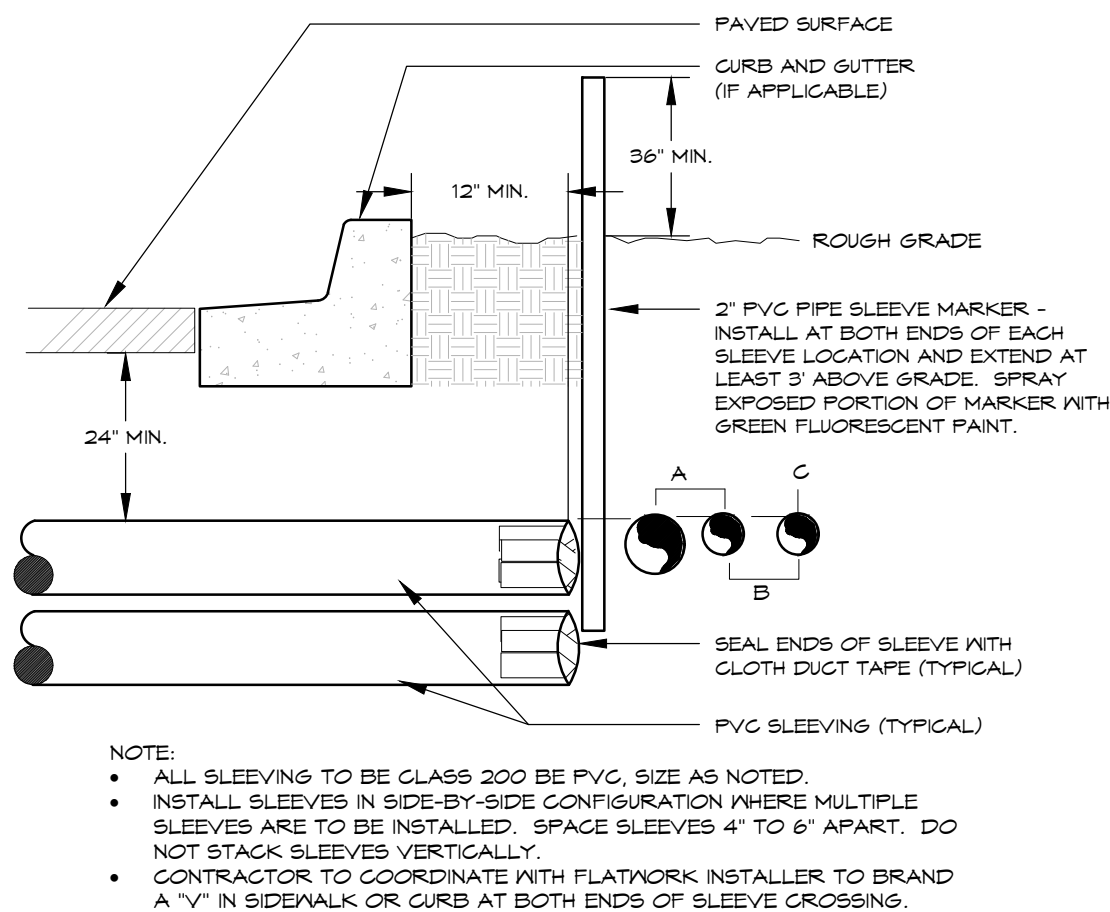
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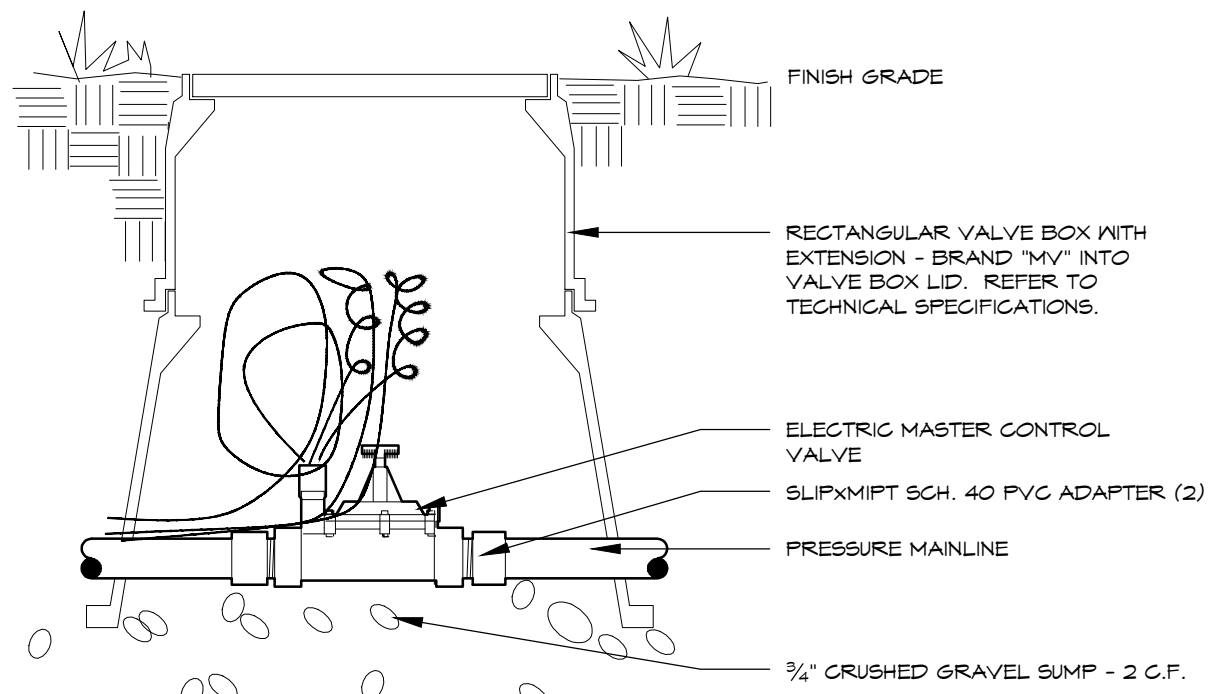
TRENCH

1



IRRIGATION SLEEVING

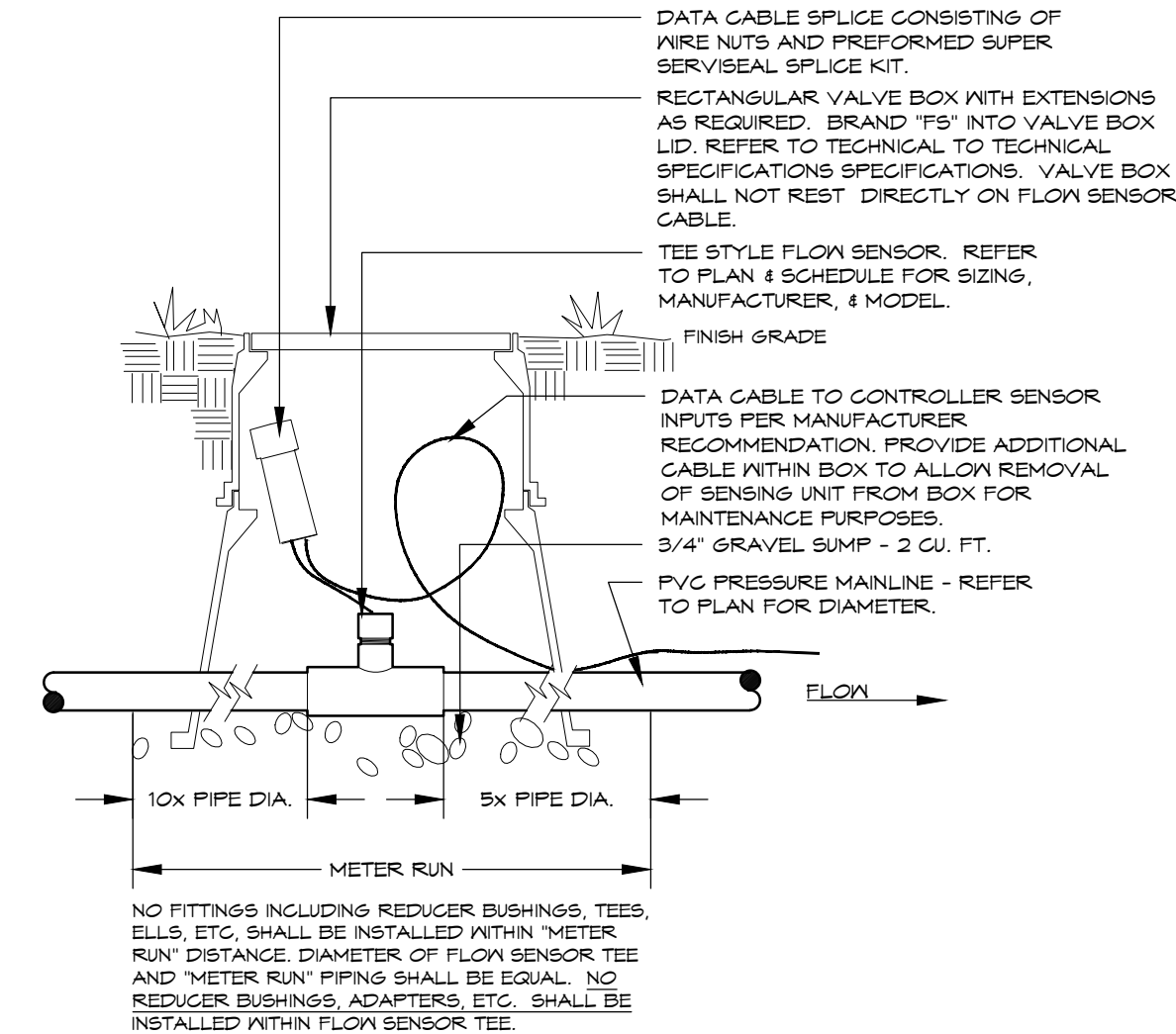
2



MASTER VALVE

24V - Small - Typical

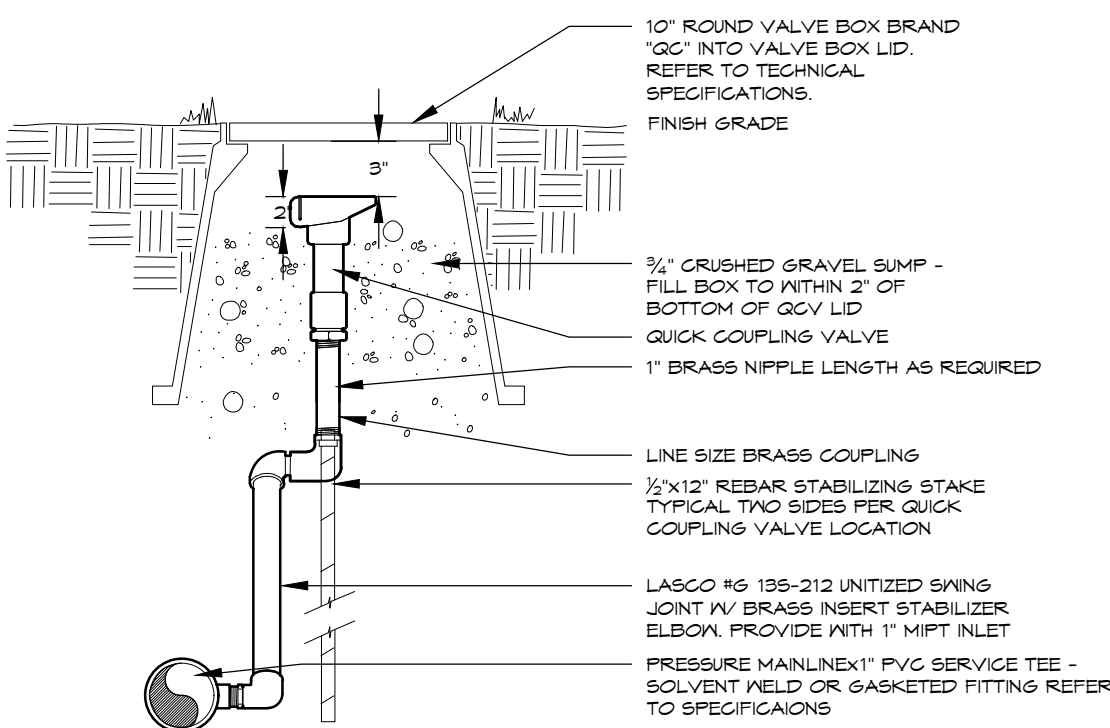
3



FLOW SENSOR

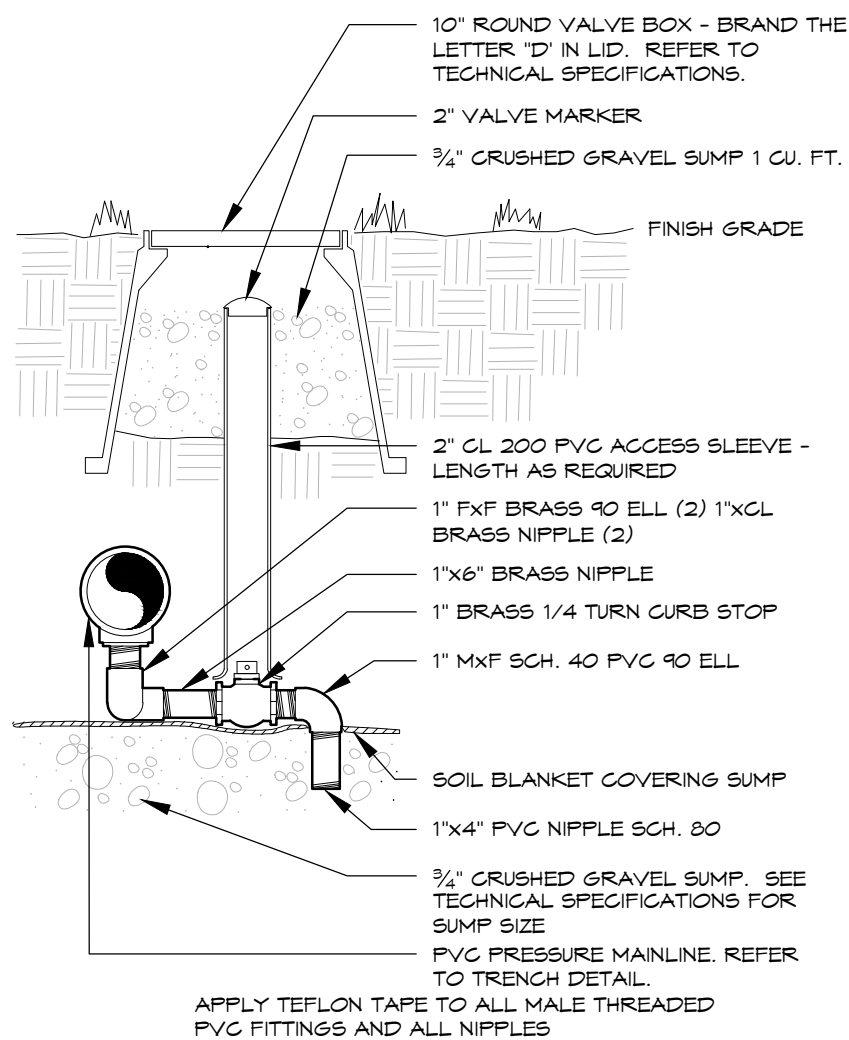
VIA DATA CABLE - TEE STYLE

4



QUICK COUPLING VALVE

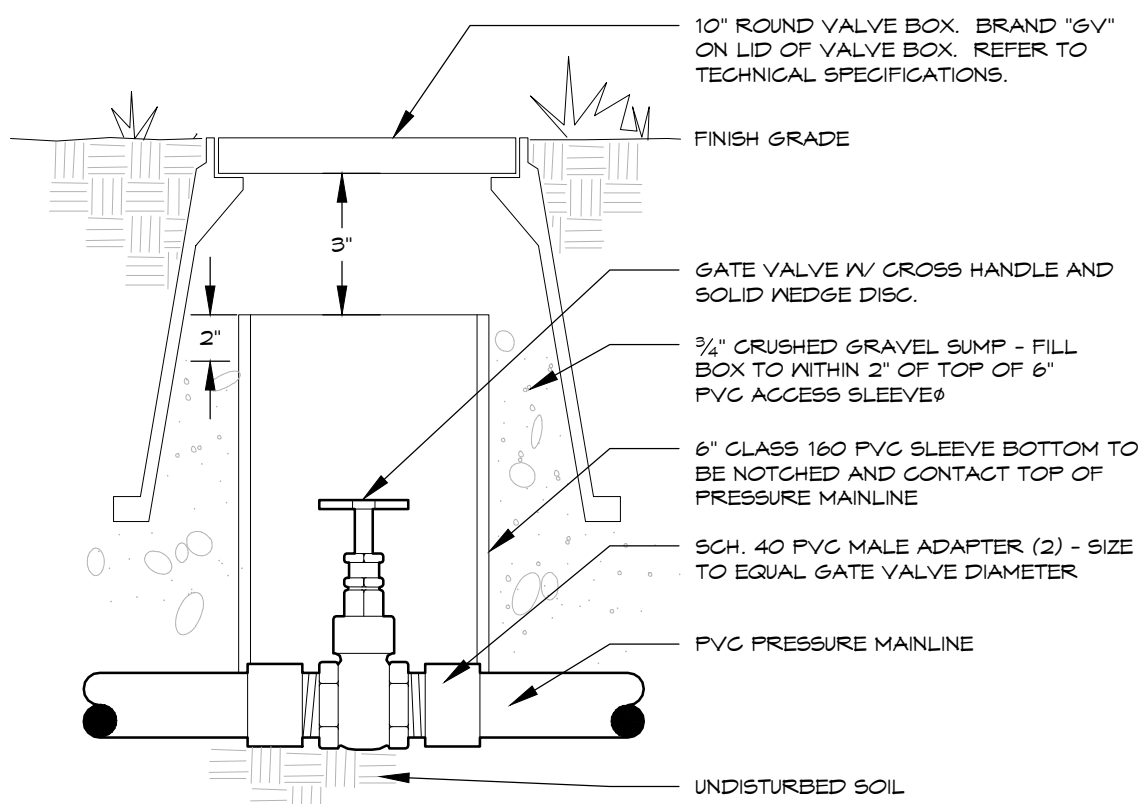
5



MANUAL DRAIN VALVE

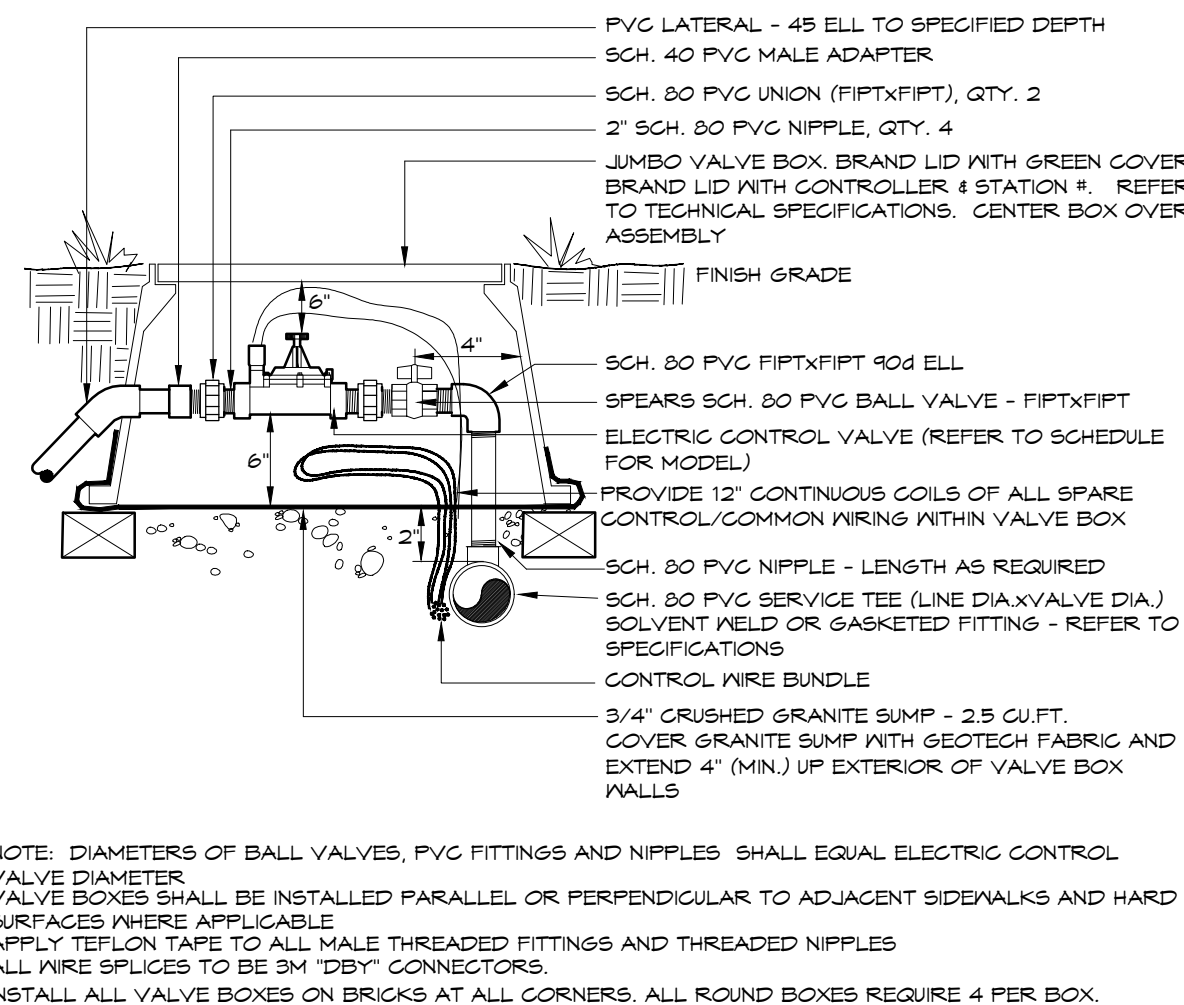
TYPICAL

6



GATE VALVE

7



ELECTRIC CONTROL VALVE

8

## DIRECTORY

IRRIGATION NOTES & SCHEDULE

IRRIGATION PLANS

IRRIGATION DETAILS

IRRIGATION CHARTS

IR.1

IR.2 - IR.5

IR.6 - IR.8

IR.8 - IR.10



CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.



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o: 303.980.5327 www.hydrosystemsmdi.com

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### Sheet Revisions

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|      |      |          |       |
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|      |      |          |       |

ROARING FORK TRANSPORTATION AUTHORITY

## WEST GLENWOOD TRANSIT CENTER

2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

### FIR Plans

No Revisions:

Revised:

Void:

### IRRIGATION DETAILS

Designer:

KJD

Detailer:

JSB

Sheet Subset:

IR403

Subset Sheets:

of

### Project No./Code

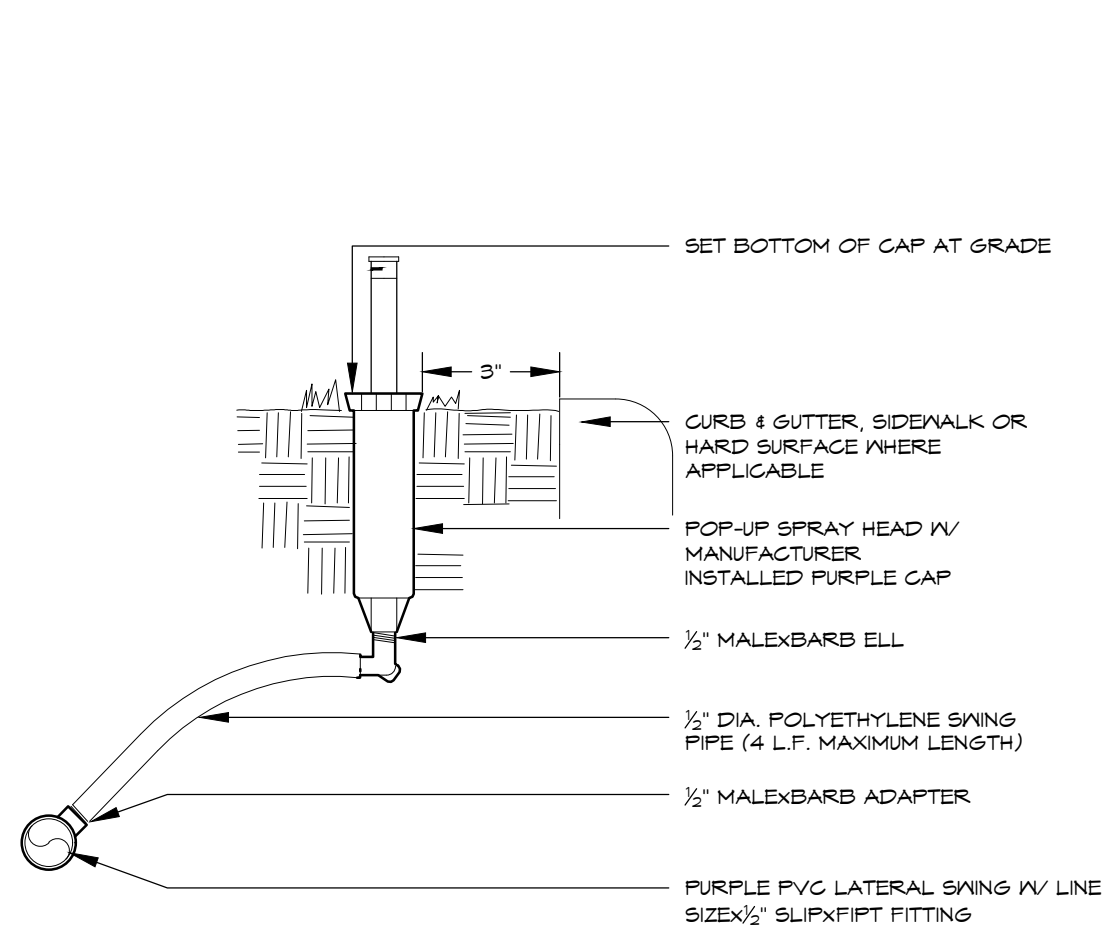
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25924

Sheet Number



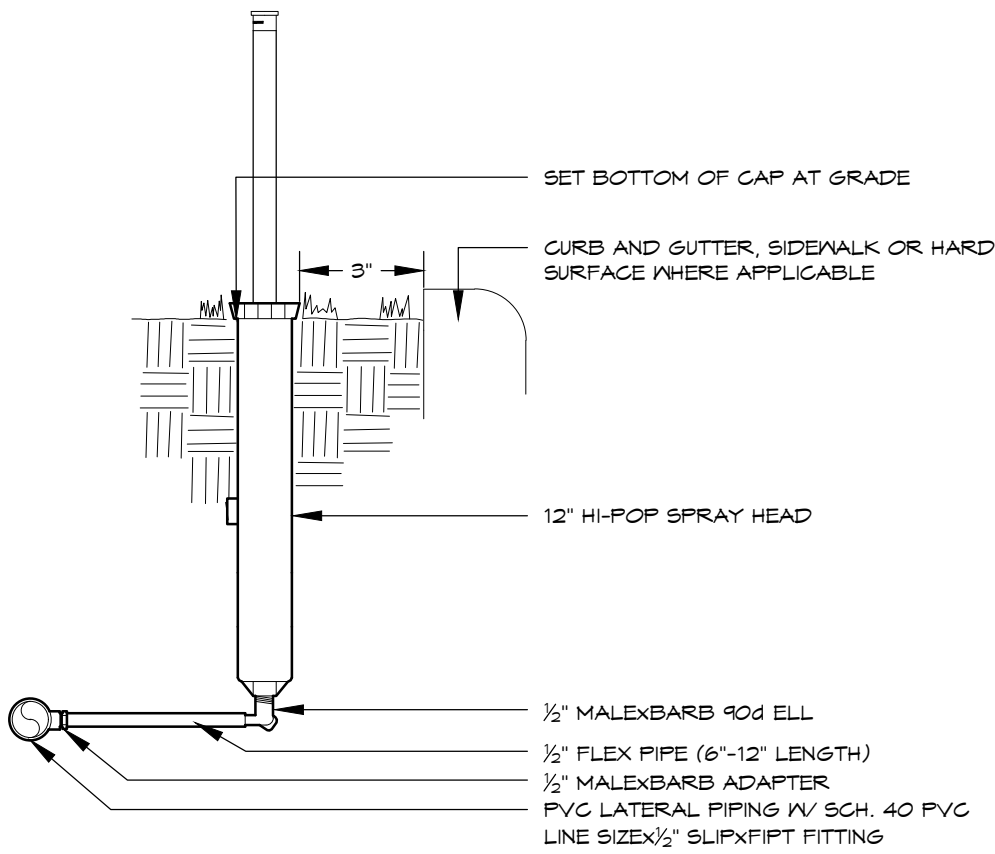
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- NOTE:
- SET HEAD PERPENDICULAR TO FINISH GRADE.
  - APPLY TEFLON TAPE TO MALE PVC THREADED FITTINGS.
  - DOUBLE CLAMP 1/2" & 2" DIAMETER FITTINGS.

### POP-UP SPRAY HEAD

9

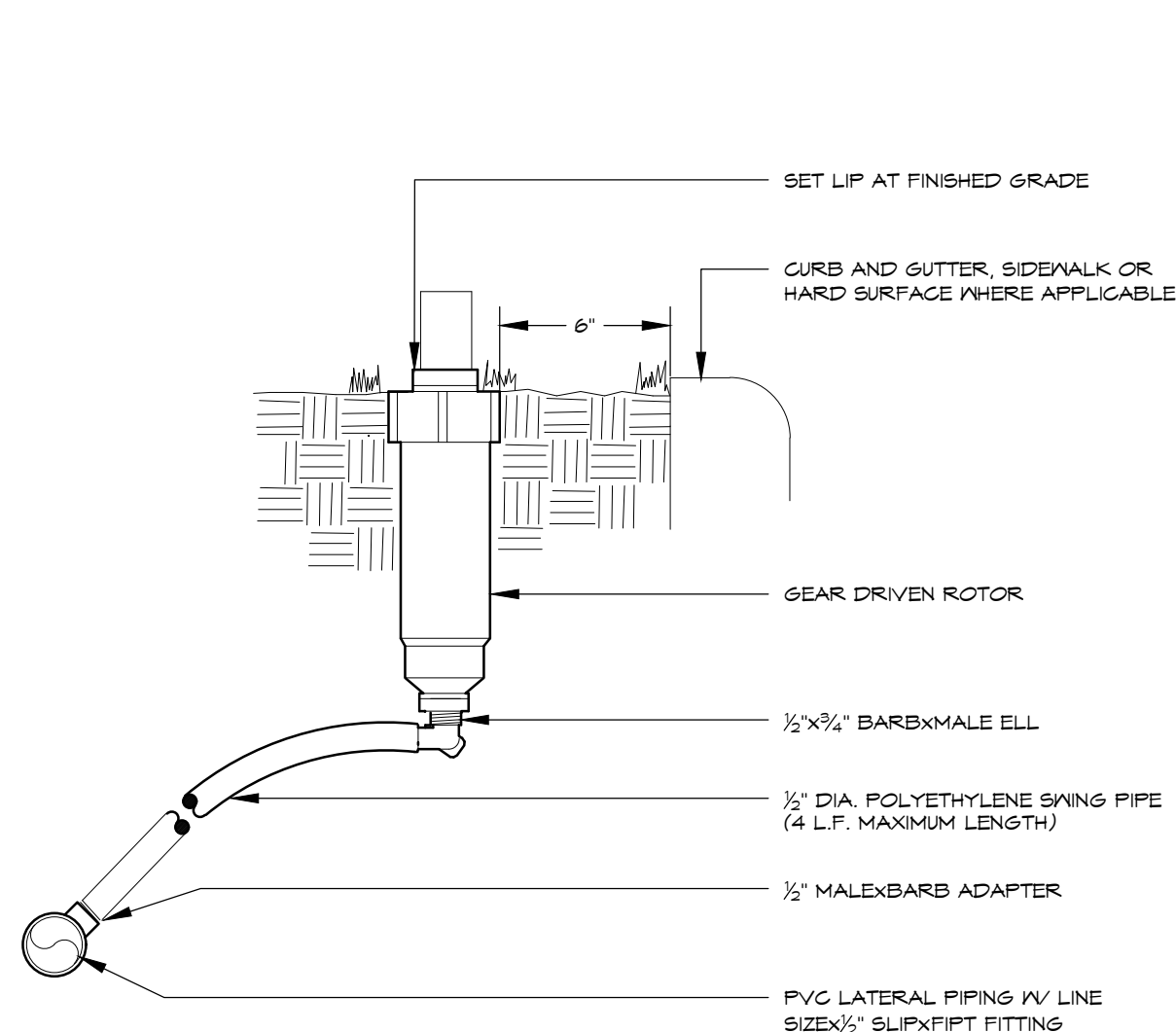


- NOTE:
- SET HEAD PERPENDICULAR TO FINISH GRADE SWING.
  - FLEX PIPE SHALL BE ATTACHED TO BOTTOM SPRAY HEAD INLET ONLY.
  - APPLY TEFLON TAPE TO ALL MALE PVC THREADED FITTINGS AND NIPPLES.

### HI-POP SPRAY HEAD

SWING PIPE - PVC

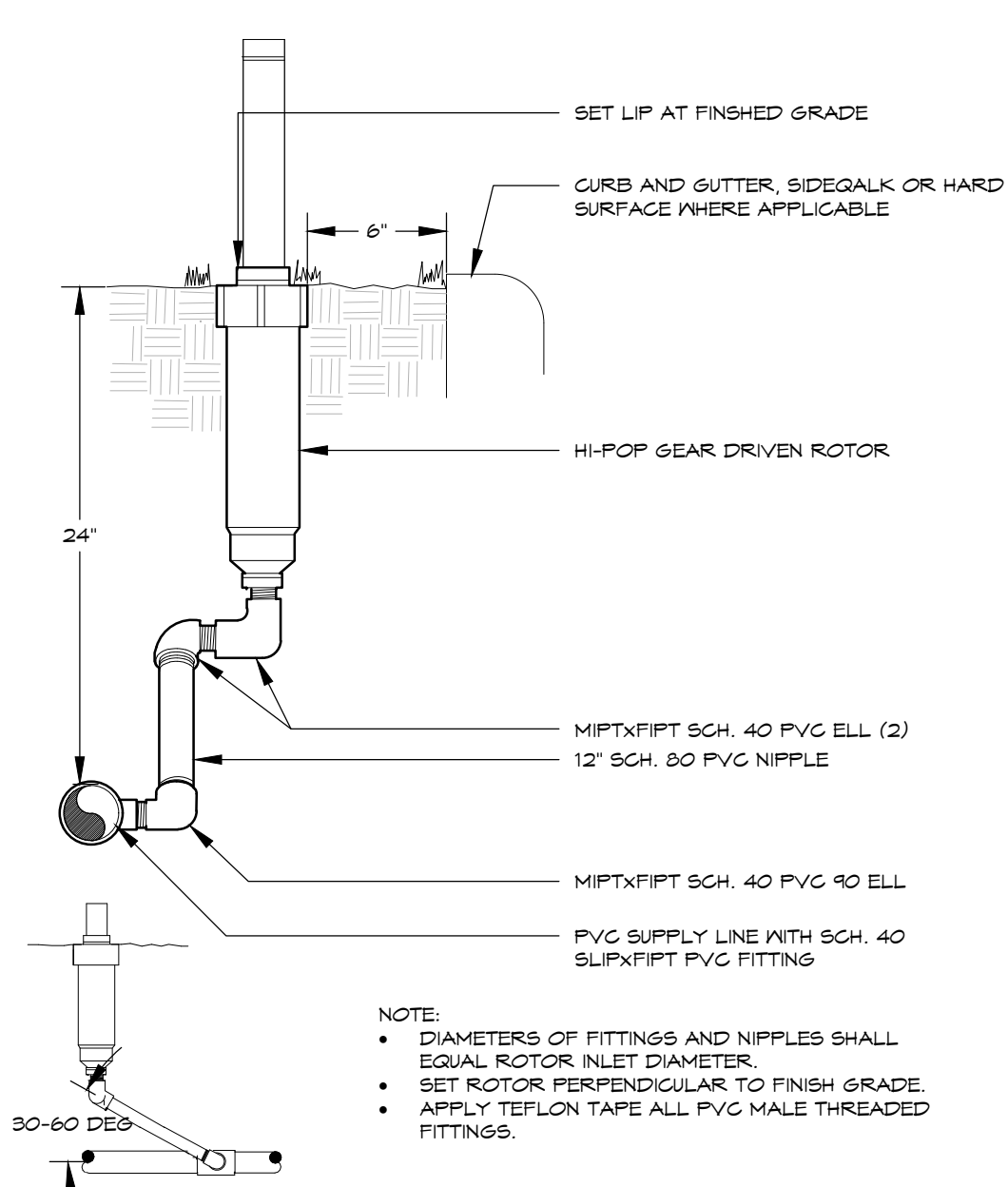
10



SET HEAD PERPENDICULAR TO FINISH GRADE

### GEAR DRIVEN ROTOR

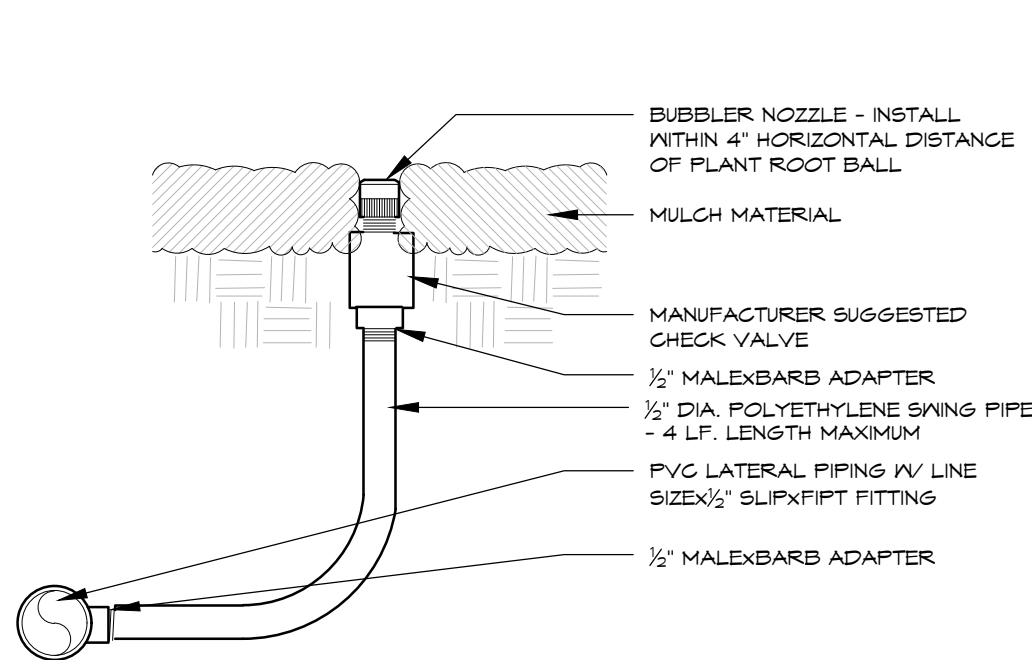
11



- NOTE:
- DIAMETERS OF FITTINGS AND NIPPLES SHALL EQUAL ROTOR INLET DIAMETER.
  - SET ROTOR PERPENDICULAR TO FINISH GRADE.
  - APPLY TEFLON TAPE ALL PVC MALE THREADED FITTINGS.

### HI-POP GEAR DRIVEN ROTOR

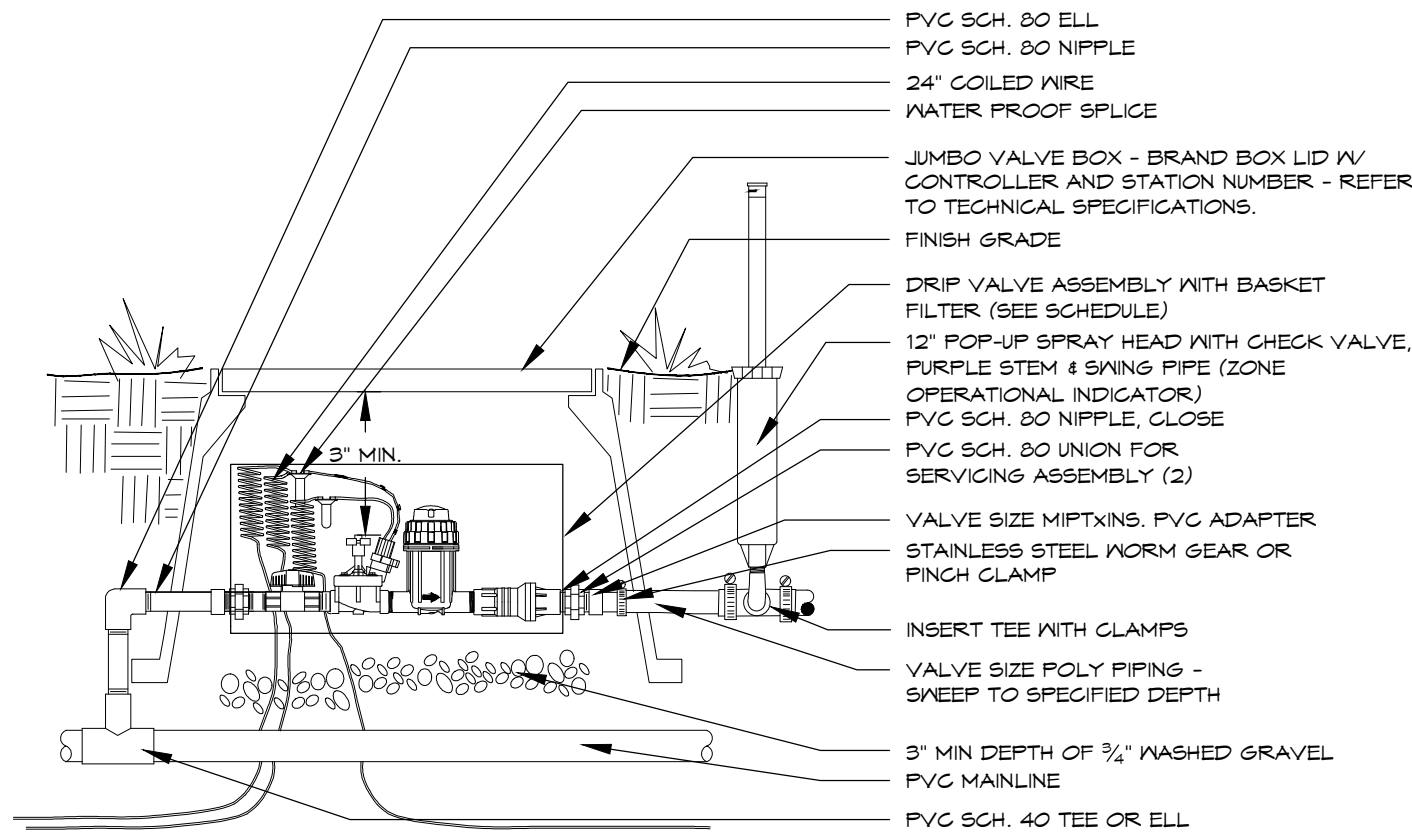
12



- NOTE:
- SET BUBBLER(S) ON UPHILL SIDE OF ROOT BALL WHERE TREES PLANTED ON SLOPES EQUAL TO OR GREATER THAN 4:1 TO 1.
  - APPLY TEFLON TAPE TO ALL MIPT FITTINGS

### BUBBLER

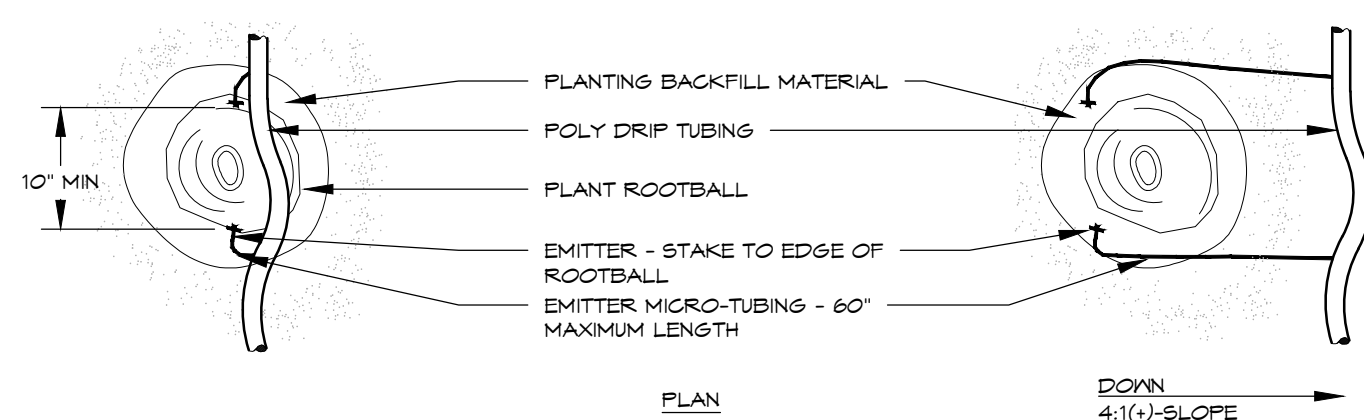
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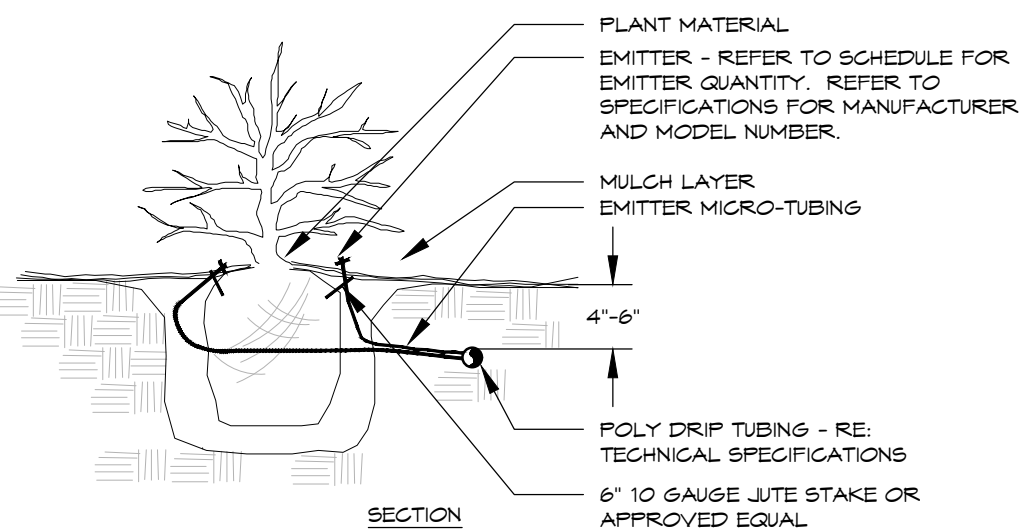
- NOTE:
- INSTALL ASSEMBLY TO REST ON GRAVEL SUMP. CONTAIN ENTIRE ASSEMBLY WITHIN BOX. NO VALVE BOX EXTENSIONS WILL BE ACCEPTED. PROVIDE 3'-4\"/>

### DRIP VALVE

14



| PLANT SIZE             | EMITTER FLOW RATE | EMITTER QTY. AT MULCHED BED LOCATIONS | EMITTER QTY. AT NATIVE SEED LOCATIONS |
|------------------------|-------------------|---------------------------------------|---------------------------------------|
| 1 - 2 GALLON MATERIAL  | 0.5 GPH           | ONE EACH                              | ONE EACH                              |
| 5 GALLON MATERIAL      | 0.5 GPH           | TWO EACH                              | TWO EACH                              |
| 1 1/4\" CALIPER TREE   | 1.0 GPH           | THREE EACH                            | FOUR EACH                             |
| 2\" CALIPER TREE       | 1.0 GPH           | FOUR EACH                             | SIX EACH                              |
| 2 1/2\" CALIPER TREE   | 1.0 GPH           | SIX EACH                              | EIGHT EACH                            |
| 3\" CALIPER TREE       | 1.0 GPH           | EIGHT EACH                            | TEN EACH                              |
| 3 1/2\" CALIPER TREE   | 1.0 GPH           | NINE EACH                             | ELEVEN EACH                           |
| 4\" CALIPER TREE       | 1.0 GPH           | TEN EACH                              | TWELVE EACH                           |
| 6 FT. CONIFEROUS TREE  | 1.0 GPH           | FOUR EACH                             | SIX EACH                              |
| 8 FT. CONIFEROUS TREE  | 1.0 GPH           | SIX EACH                              | NINE EACH                             |
| 10 FT. CONIFEROUS TREE | 1.0 GPH           | EIGHT EACH                            | TWELVE EACH                           |
| 12 FT. CONIFEROUS TREE | 1.0 GPH           | TEN EACH                              | FOURTEEN EACH                         |



- NOTES:
- INSTALL EMITTERS ON OPPOSING SIDES OF ROOTBALL. THREE OR MORE EMITTERS SHALL BE EQUALLY SPACED AROUND ROOTBALL.
  - EMITTERS ARE TO BE INSTALLED TO CLEAR SURFACE BY A MINIMUM OF 1\"/>

### DRIP EMITTER

BELOW GRADE

15

## DIRECTORY

## IRRIGATION NOTES & SCHEDULE

## IRRIGATION PLANS

## IRRIGATION DETAILS

## IRRIGATION CHARTS

IR.1

IR.2 - IR.5

IR.6 - IR.8

IR.8 - IR.10



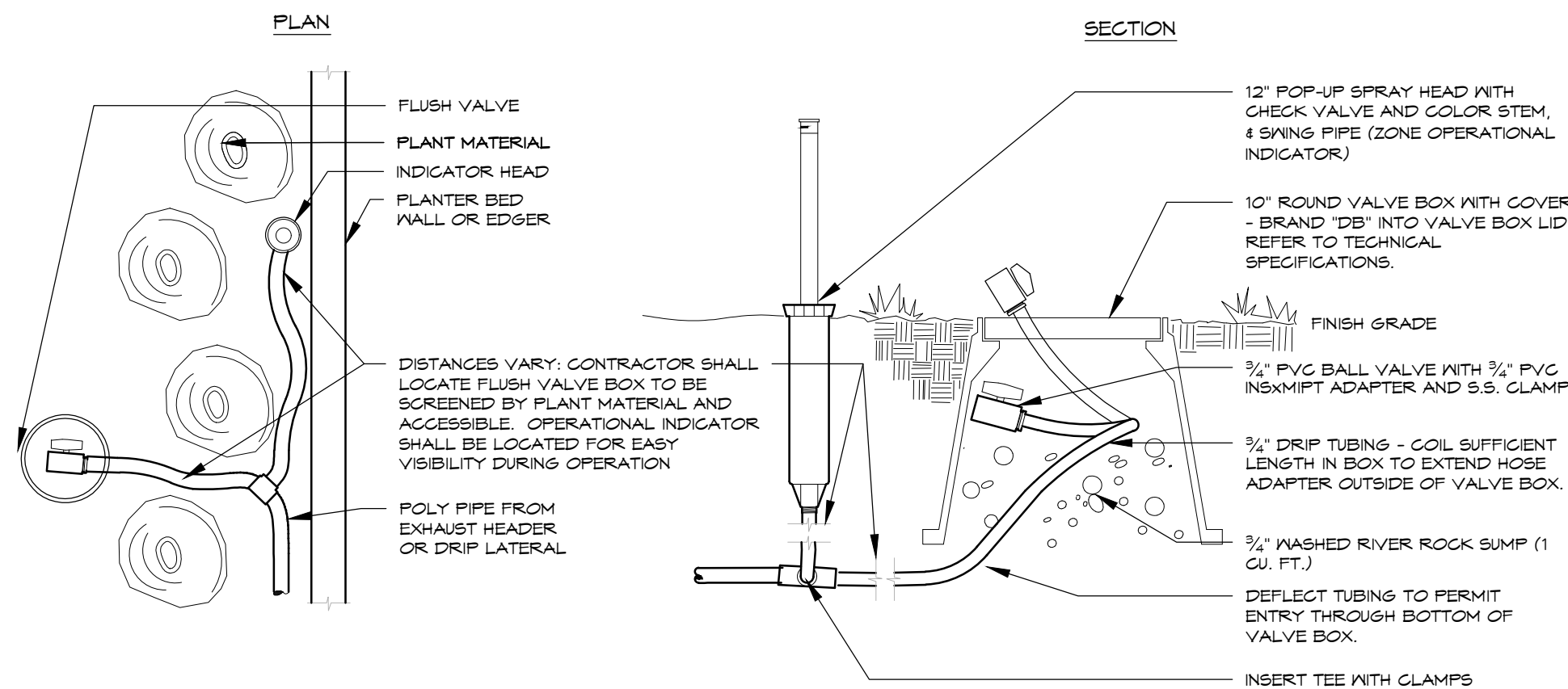
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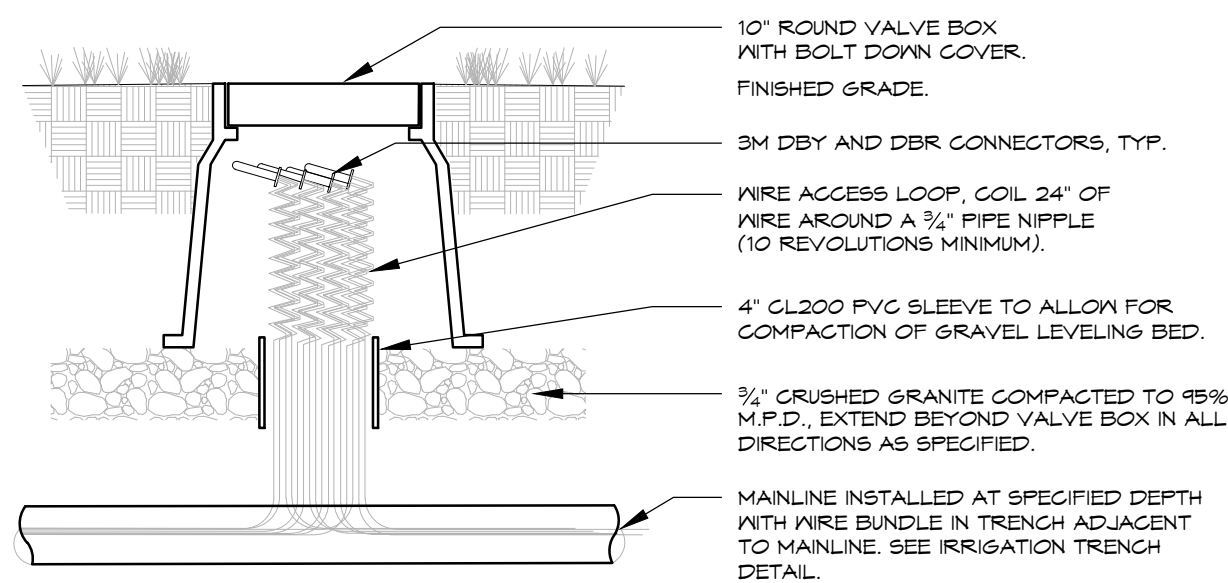
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| Print Date: 6/27/2024 11:09 AM                                                      |                                | Sheet Revisions       |      |             |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b> |                                                  | FIR Plans     |  | IRRIGATION DETAILS         |                   |  |              | Project No./Code |  |
| File Name: 0-23019-IRRIGATION_TRANSIT.dwg                                           |                                | Rev.                  | Date | Comments    | Init. |                                                                              |                                                  |               |  |                            |                   |  |              |                  |  |
| Horiz. Scale: As Noted                                                              |                                | Vert. Scale: As Noted |      | <div></div> |       |                                                                              |                                                  | No Revisions: |  |                            |                   |  |              | TRG M535-014     |  |
|  | Short Elliott Hendrickson Inc. |                       |      |             |       |                                                                              | 2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 | Revised:      |  | Designer: KJD              | Structure         |  | 25924        |                  |  |
|                                                                                     | Colorado Center Tower One      |                       |      |             |       |                                                                              |                                                  |               |  |                            |                   |  |              |                  |  |
|                                                                                     | Suite 6000                     |                       |      |             |       |                                                                              |                                                  |               |  | Detailer: JSB              | Numbers           |  |              |                  |  |
|                                                                                     | 2000 South Colorado Boulevard  |                       |      |             |       |                                                                              |                                                  |               |  | Sheet Subset: <b>IR404</b> | Subset Sheets: of |  | Sheet Number |                  |  |
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| (800) 490-4966                                                                      |                                |                       |      |             |       |                                                                              |                                                  |               |  |                            |                   |  |              |                  |  |
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DRIP FLUSH VALVE  
WITH OPERATIONAL INDICATOR

16



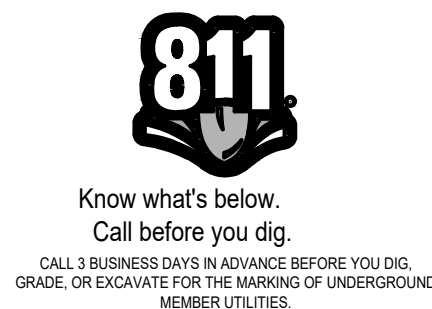
- NOTE:
1. SET TOP OF BOX LEVEL WITH FINISHED GRADE IN TURF AREAS AND LEVEL WITH TOP OF MULCH IN SHRUB BEDS.
  2. USE STANDARD RECTANGULAR VALVE BOX WITH BOLT DOWN LID FOR SPLICES OF MORE THAN TWENTY (20) WIRES.

WIRE SPLICE BOX  
24V WIRING SYSTEM

17

DIRECTORY  
IRRIGATION NOTES & SCHEDULE  
IRRIGATION PLANS  
IRRIGATION DETAILS  
IRRIGATION CHARTS

IR.1  
IR.2 - IR.5  
IR.6 - IR.8  
IR.8 - IR.10

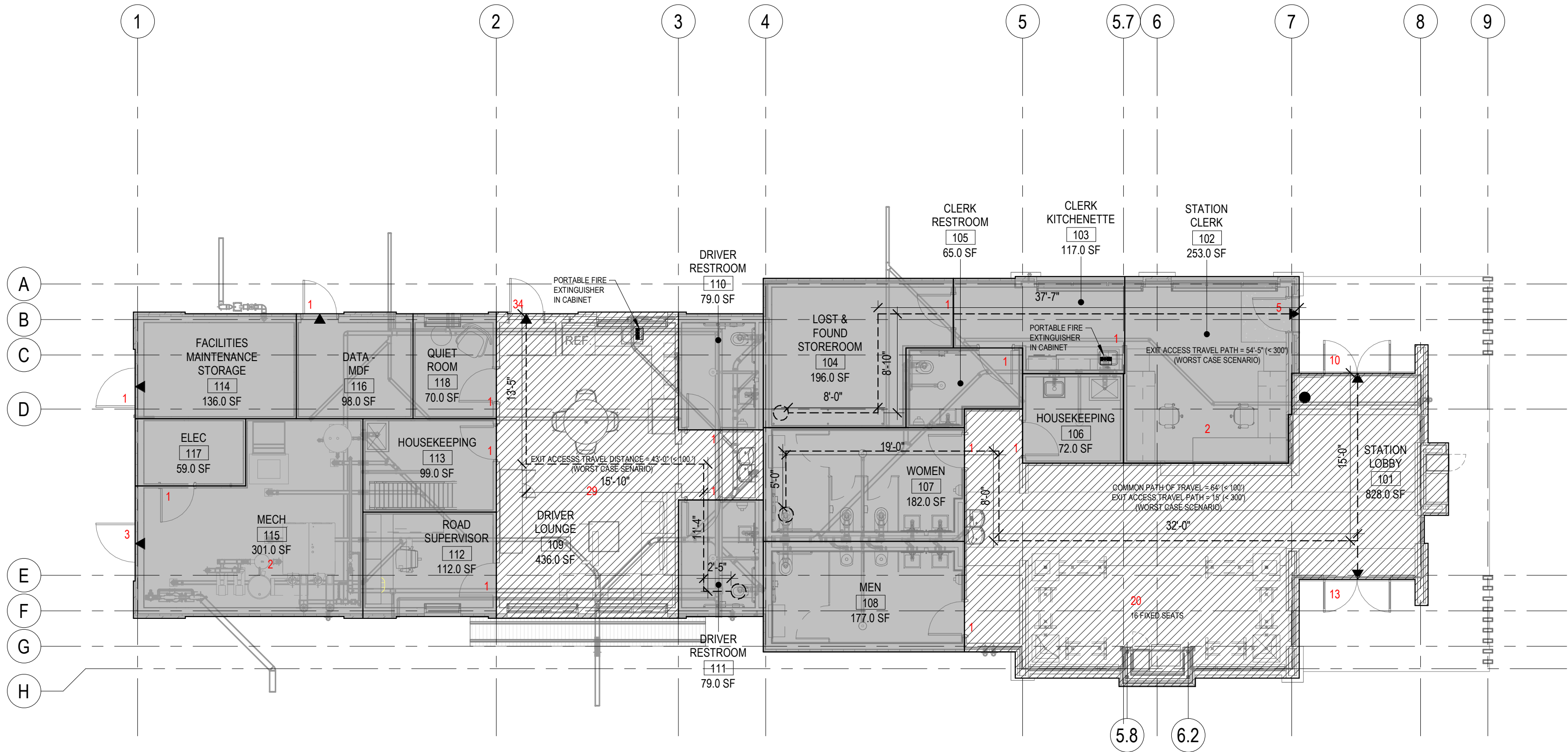


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| Print Date: 6/27/2024 11:09 AM                                                                                                                                                                                                                                                         | Sheet Revisions      |      |          |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b><br><br>2307 WULFSOHN ROAD<br>GLENWOOD SPRINGS, CO 81601 | FIR Plans     |  | IRRIGATION DETAILS         |                   |    | Project No./Code |  |
| File Name: 0-23019-IRRIGATION_TRANSIT.dwg                                                                                                                                                                                                                                              | Rev.                 | Date | Comments | Init. |                                                                                                                                      | No Revisions: |  |                            |                   |    | TRG M535-014     |  |
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|  Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 | <input type="text"/> |      |          |       |                                                                                                                                      | Void:         |  | Detailer: JSB              |                   |    | Sheet Number     |  |
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Copy and Paste Code Summary Notes in this View



1 CODE PLAN - LEVEL 1  
1/8" = 1'-0"

| OCCUPANCY SCHEDULE - GROSS |            |                                |                          |           |                |                      |                           |
|----------------------------|------------|--------------------------------|--------------------------|-----------|----------------|----------------------|---------------------------|
| NO.                        | SPACE CODE | ROOM NAME                      | GROSS AREA               | OCCUPANCY | OCC. FACTOR    | OCC. LOAD            | NOTES                     |
| 101                        | OP251      | STATION LOBBY                  | 828.0 SF                 | ASSEMBLY  | 20 FIXED SEATS | 20                   | 1 PERSON PER SEAT (FIXED) |
| 102                        | OP155-156  | STATION CLERK                  | 253.0 SF                 | BUSINESS  | 150            | 1.7                  |                           |
| 103                        | OP157      | CLERK KITCHENETTE              | 117.0 SF                 | BUSINESS  | 150            | 0.8                  |                           |
| 104                        | OP205      | LOST & FOUND STOREROOM         | 196.0 SF                 | BUSINESS  | 150            | 1.3                  |                           |
| 105                        | OP1243     | CLERK RESTROOM                 | 65.0 SF                  | BUSINESS  | 150            | 0.4                  |                           |
| 106                        | FM526B     | HOUSEKEEPING                   | 72.0 SF                  | BUSINESS  | 150            | 0.5                  |                           |
| 107                        | OP254      | WOMEN                          | 182.0 SF                 | BUSINESS  | 150            | 1.2                  |                           |
| 108                        | OP 254     | MEN                            | 177.0 SF                 | BUSINESS  | 150            | 1.2                  |                           |
| 109                        | OP223      | DRIVER LOUNGE                  | 436.0 SF                 | ASSEMBLY  | 15             | 29.1                 | NET A-3 UNCONCENTRATED    |
| 110                        | OP241      | DRIVER RESTROOM                | 490 GSF/436 NSF          | BUSINESS  | 150            | 0.5                  |                           |
| 111                        | OP242      | DRIVER RESTROOM                | 79.0 SF                  | BUSINESS  | 150            | 0.5                  |                           |
| 112                        | OP151      | ROAD SUPERVISOR                | 112.0 SF                 | BUSINESS  | 150            | 0.7                  |                           |
| 113                        | FM526A     | HOUSEKEEPING                   | 99.0 SF                  | BUSINESS  | 150            | 0.7                  |                           |
| 114                        | FM223      | FACILITIES MAINTENANCE STORAGE | 136.0 SF                 | BUSINESS  | 150            | 0.9                  |                           |
| 115                        | OP253      | MECH                           | 301.0 SF                 | BUSINESS  | 150            | 2.0                  |                           |
| 116                        | FM544      | DATA - MDF                     | 98.0 SF                  | BUSINESS  | 150            | 0.7                  |                           |
| 117                        |            | ELEC                           | 59.0 SF                  | BUSINESS  | 150            | 0.4                  |                           |
| 118                        |            | QUIET ROOM                     | 70.0 SF                  | BUSINESS  | 150            | 0.5                  |                           |
| TOTAL                      |            |                                | 3359.0 SF<br>3,413.0 GSF |           |                | 43.0<br>63 OCCUPANTS |                           |

CODE ANALYSIS

APPLICABLE CODES  
2021 INTERNATIONAL BUILDING CODE (IBC)  
INCLUDING GLENWOOD SPRINGS AMENDMENTS TO THE IBC  
2021 INTERNATIONAL PLUMBING CODE (IPC)  
2021 INTERNATIONAL MECHANICAL CODE (IMC)  
2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)  
2021 INTERNATIONAL FIRE CODE (IFC)  
2021 INTERNATIONAL FUEL GAS CODE (IFGC)  
2020 NATIONAL ELECTRIC CODE (NEC)

IBC CHAPTER 3 USE AND OCCUPANCY

USE: BUSINESS  
OCCUPANCY: B

303.1.2 SMALL ASSEMBLY SPACES. THE FOLLOWING ROOMS AND SPACES SHALL NOT BE CLASSIFIED AS ASSEMBLY OCCUPANCIES:  
1. A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES WITH AN OCCUPANT LOAD OF LESS THAN 50 PERSONS AND ACCESSORY TO ANOTHER OCCUPANCY SHALL BE CLASSIFIED AS A **GROUP B** OCCUPANCY OR AS PART OF THAT OCCUPANCY.  
2. A ROOM OR SPACE USED FOR ASSEMBLY PURPOSES THAT IS LESS THAN 750 SQUARE FEET (70 M<sup>2</sup>) IN AREA AND ACCESSORY TO ANOTHER OCCUPANCY SHALL BE CLASSIFIED AS A **GROUP B** OCCUPANCY OR AS PART OF THAT OCCUPANCY.

311.1.1 ACCESSORY STORAGE SPACES. A ROOM OR SPACE USED FOR STORAGE PURPOSES THAT IS ACCESSORY TO ANOTHER OCCUPANCY SHALL BE CLASSIFIED AS PART OF THAT OCCUPANCY.

IBC CHAPTER 4 SPECIAL REQUIREMENTS

IBC CHAPTER 5 BUILDING HEIGHTS AND AREAS (TYPE V-B / S)

| TABLE | BUILDING HEIGHT:   | ALLOWED = | 60'            |
|-------|--------------------|-----------|----------------|
| 504.3 |                    | ACTUAL =  | 21' - 2" TOTAL |
| TABLE | NUMBER OF STORIES: | ALLOWED = | 3 STORIES      |
| 504.4 |                    | ACTUAL =  | 1 STORY        |
| TABLE | BUILDING AREA:     | ALLOWED = | 36,000 SF      |
| 506.2 |                    | ACTUAL =  | 3,413 GSF      |

IBC CHAPTER 6 TYPES OF CONSTRUCTION

CONSTRUCTION: TYPE V-B

TABLE 601 FIRE-RESISTANCE RATING REQUIREMENTS

- PRIMARY STRUCTURAL FRAME = 0 HOUR
- BEARING WALLS EXTERIOR = 0 HOUR
- BEARING WALLS INTERIOR = 0 HOUR
- NONBEARING WALLS AND PARTITIONS - EXTERIOR = 0 HOUR
- NONBEARING WALLS AND PARTITIONS - INTERIOR = 0 HOUR
- FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS = 0 HOUR
- ROOF CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS = 0 HOUR

IBC CHAPTER 7 FIRE AND SMOKE PROTECTION FEATURES

N/A

IBC CHAPTER 8 INTERIOR FINISHES

TABLE 803.13 INTERIOR WALL AND CEILING FINISH REQ'S

- INTERIOR EXIT STAIRWAYS AND RAMPS AND EXIT PASSAGEWAYS = B
- CORRIDORS AND ENCLOSURE FOR EXIT ACCESS STAIRWAYS AND RAMPS = C
- ROOMS AND ENCLOSED SPACES = C

IBC CHAPTER 9 FIRE PROTECTION SYSTEMS

FIRE SPRINKLER = NOT REQUIRED  
PORTABLE FIRE EXTINGUISHERS = REQUIRED  
FIRE ALARM AND SMOKE DETECTION SYSTEMS = NOT REQUIRED

IBC CHAPTER 10 MEANS OF EGRESS

1004 OCCUPANT LOAD = 63 OCCUPANTS TOTAL

1005 EGRESS WIDTH AT DOORS (0.20) = 18" MIN 34" ACTUAL  
1005 EGRESS WIDTH AT CORRIDORS (0.30) = 27" MIN 4'-7" ACTUAL

TABLE 1006.2.1 COMMON PATH OF TRAVEL = 100 FT MAX FOR OCC <50

1006 MINIMUM NUMBER OF EXITS = 1 EXIT FOR OCC <50

1007 EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

**EXCEPTION 2.** WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2, THE SEPARATION DISTANCE SHALL BE NOT LESS THAN ONE-THIRD OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE AREA SERVED.

1008 MEANS OF EGRESS ILLUMINATION = YES  
1010.1.1 SIZE OF DOORS = 32" MIN CLEAR  
1010.1.10 PANIC HARDWARE = YES AT EXIT DOORS

TABLE 1017.2 EXIT ACCESS TRAVEL DISTANCE = B= 300 FT MAX

1020.1 CORRIDOR FIRE RESISTANCE = 0 HOUR  
1020.5 DEAD ENDS = 50 FT

INTERNATIONAL PLUMBING CODE - 2021

CHAPTER 4: FIXTURES, FAUCETS AND FIXTURE FITTINGS

SECTION 403 MINIMUM PLUMBING FACILITIES

(TABLE 403.1) MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES:

| Occupancy    | Load | Male WIC | Female WIC | Male Lav | Female Lav | Drinking Fnt |
|--------------|------|----------|------------|----------|------------|--------------|
| A-3 Assembly | 49   | 1/125    | 1/65       | 1/200    | 1/200      | 1/500        |
| Required     |      | 0.19     | 0.38       | 0.12     | 0.12       | 0.09         |

|            |    |               |               |               |               |       |
|------------|----|---------------|---------------|---------------|---------------|-------|
| B Business | 14 | 1/25 first 50 | 1/25 first 50 | 1/40 first 80 | 1/40 first 80 | 1/100 |
|            |    | 1/50 Remain.  | 1/50 Remain.  | 1/80 Remain.  | 1/80 Remain.  |       |
| Required   |    | 0.28          | 0.28          | 0.18          | 0.18          | 0.14  |

Total Required 1 1 1 1 1 1  
Total Provided 1 (+2 Urinal) 3 2 2 4  
1 service sink required - 1 provided  
3 additional urinal bathrooms provided with one WIC and Lav. each

SECTION 424 URINALS

(403.2) In each bathroom or toilet room, urinals shall not be substituted for more than 67 percent of the required water closets in Assembly occupancies and not more than 50 percent in Business occupancies.



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(PHASE 6A)**  
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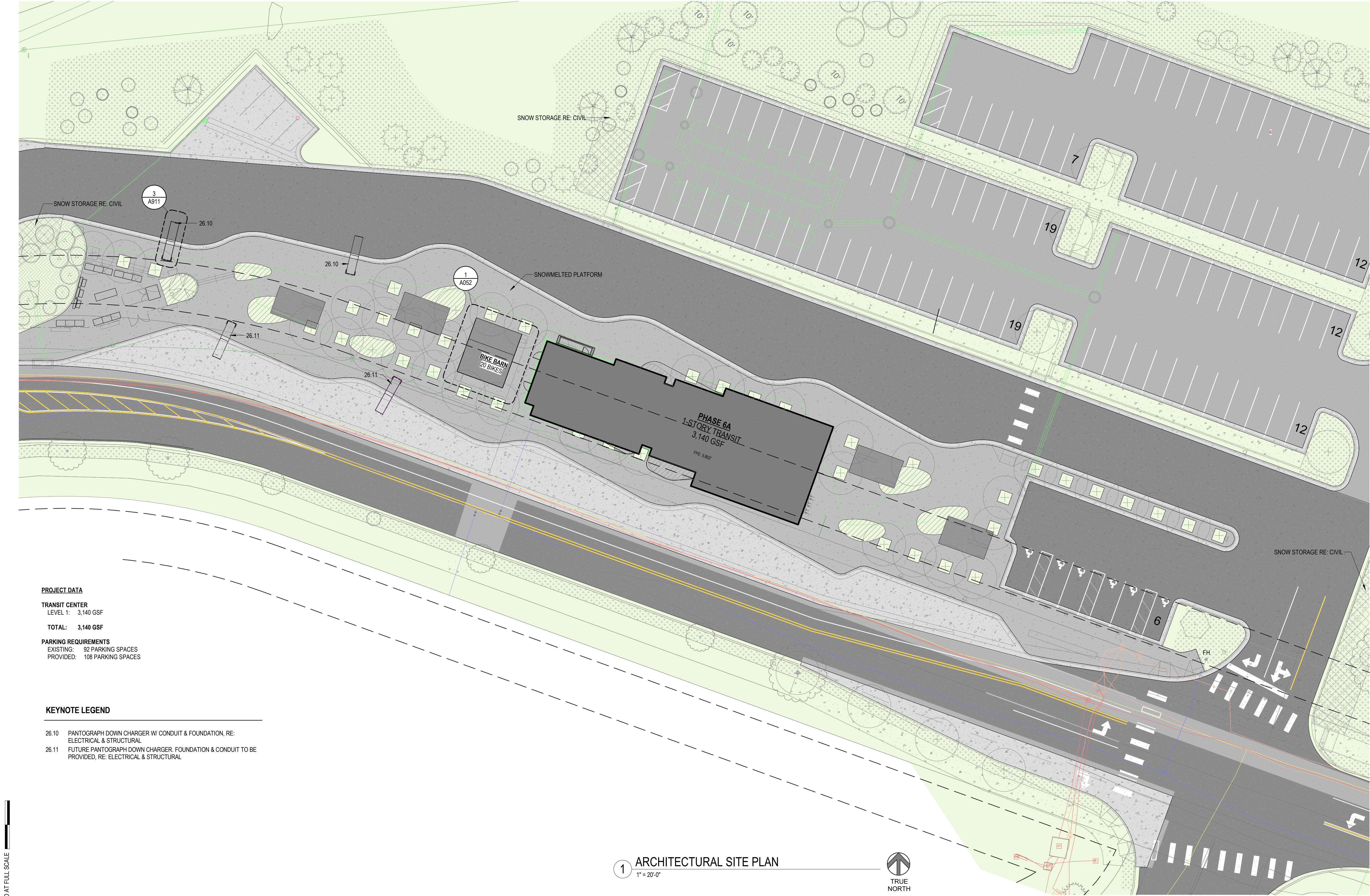
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REV. # DESCRIPTION DATE

CODE INFORMATION  
(PH-6A)

A004





**PROJECT DATA**

**TRANSIT CENTER**  
LEVEL 1: 3,140 GSF

**TOTAL:** 3,140 GSF

**PARKING REQUIREMENTS**  
EXISTING: 92 PARKING SPACES  
PROVIDED: 108 PARKING SPACES

**KEYNOTE LEGEND**

26.10 PANTOGRAPH DOWN CHARGER W/ CONDUIT & FOUNDATION, RE: ELECTRICAL & STRUCTURAL

26.11 FUTURE PANTOGRAPH DOWN CHARGER, FOUNDATION & CONDUIT TO BE PROVIDED, RE: ELECTRICAL & STRUCTURAL

1 ARCHITECTURAL SITE PLAN  
1" = 20'-0"



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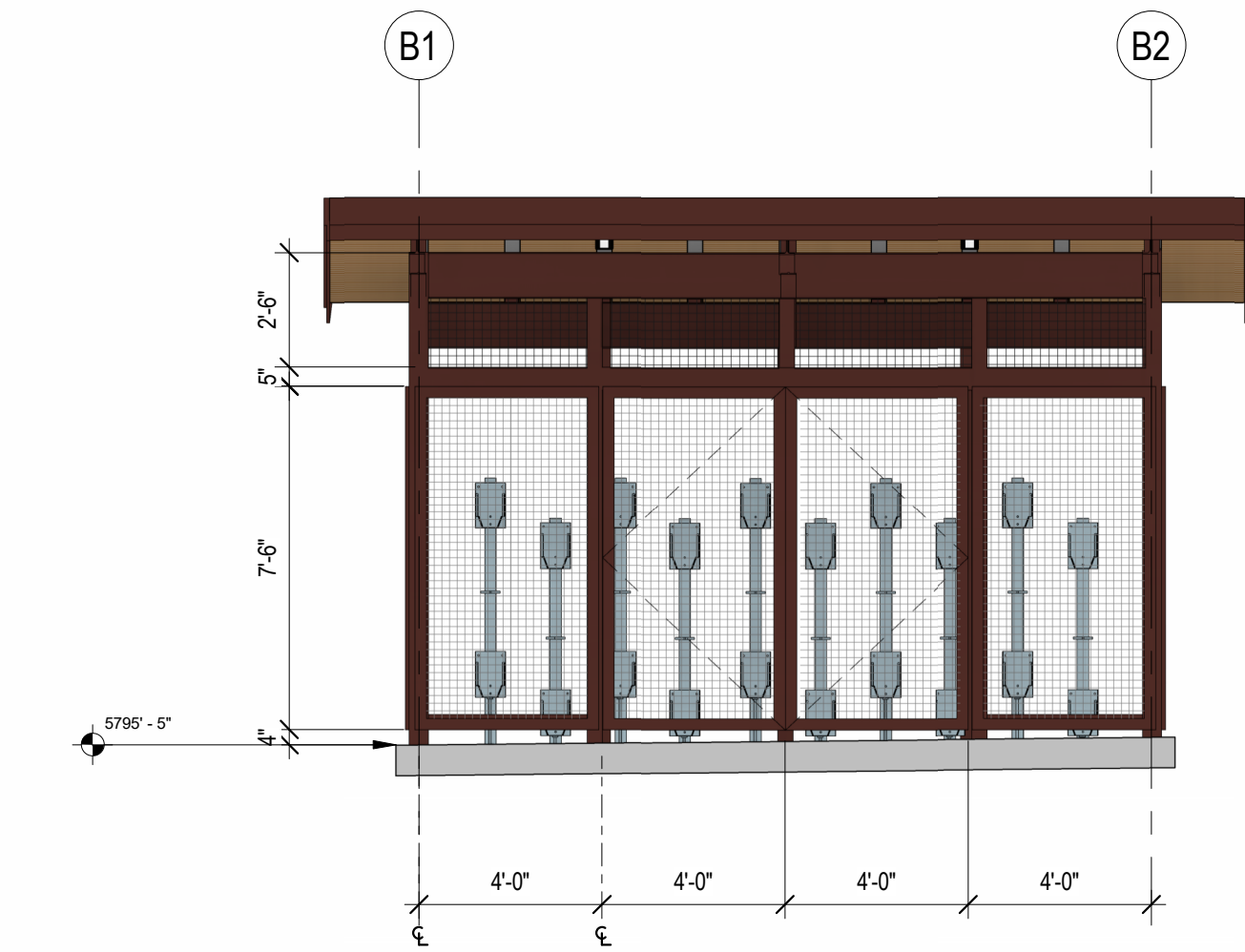
**REVISION SCHEDULE**

| REV. # | DESCRIPTION | DATE |
|--------|-------------|------|
|--------|-------------|------|

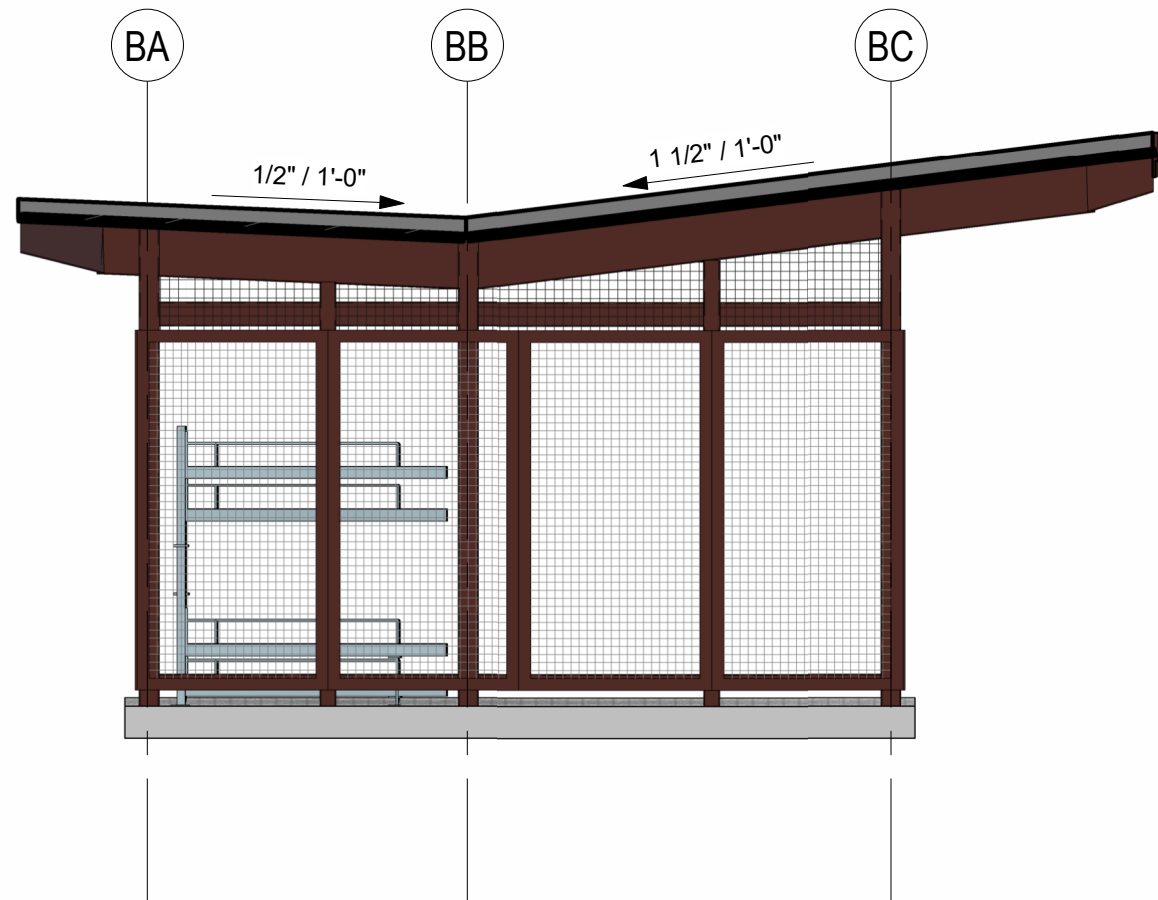
ARCHITECTURAL SITE PLAN  
(PH-6A)

A051

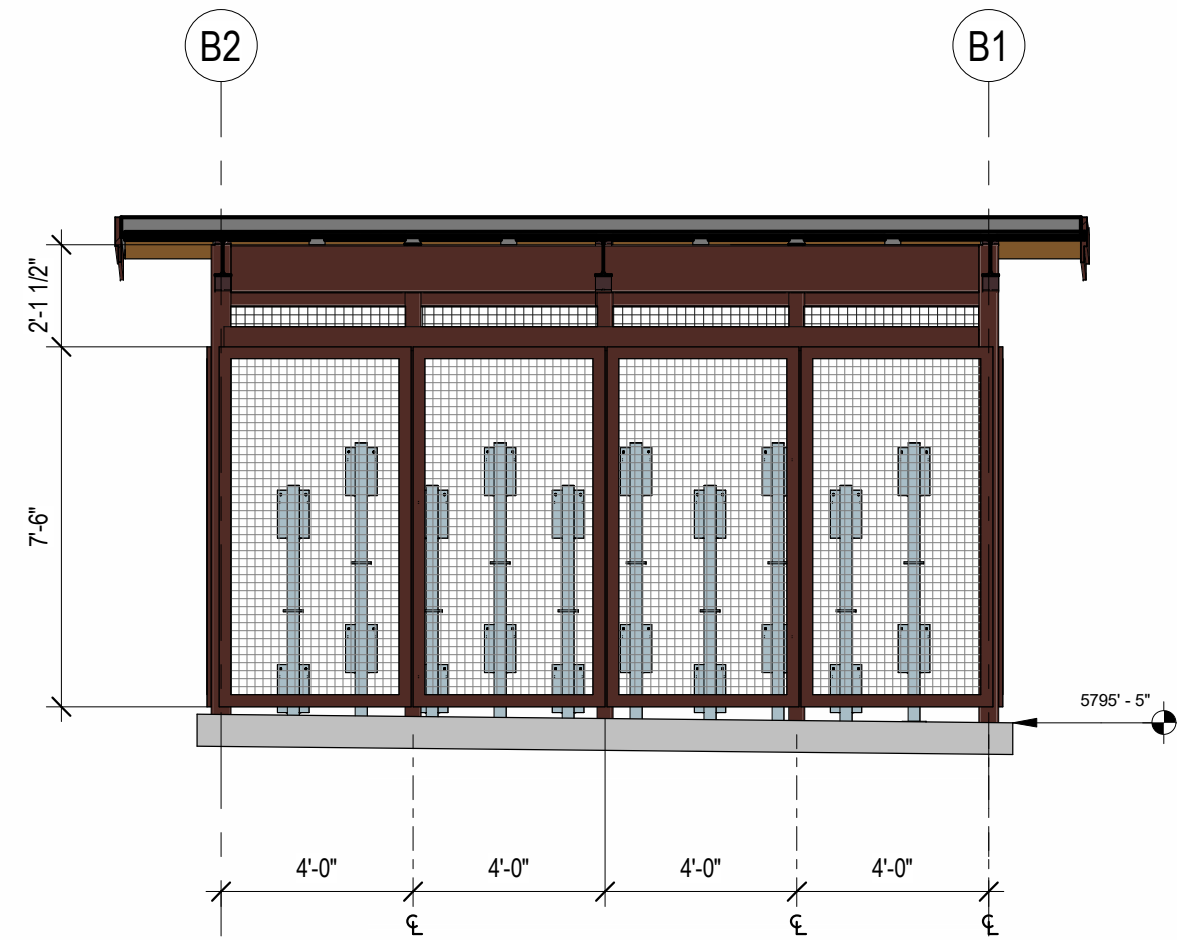




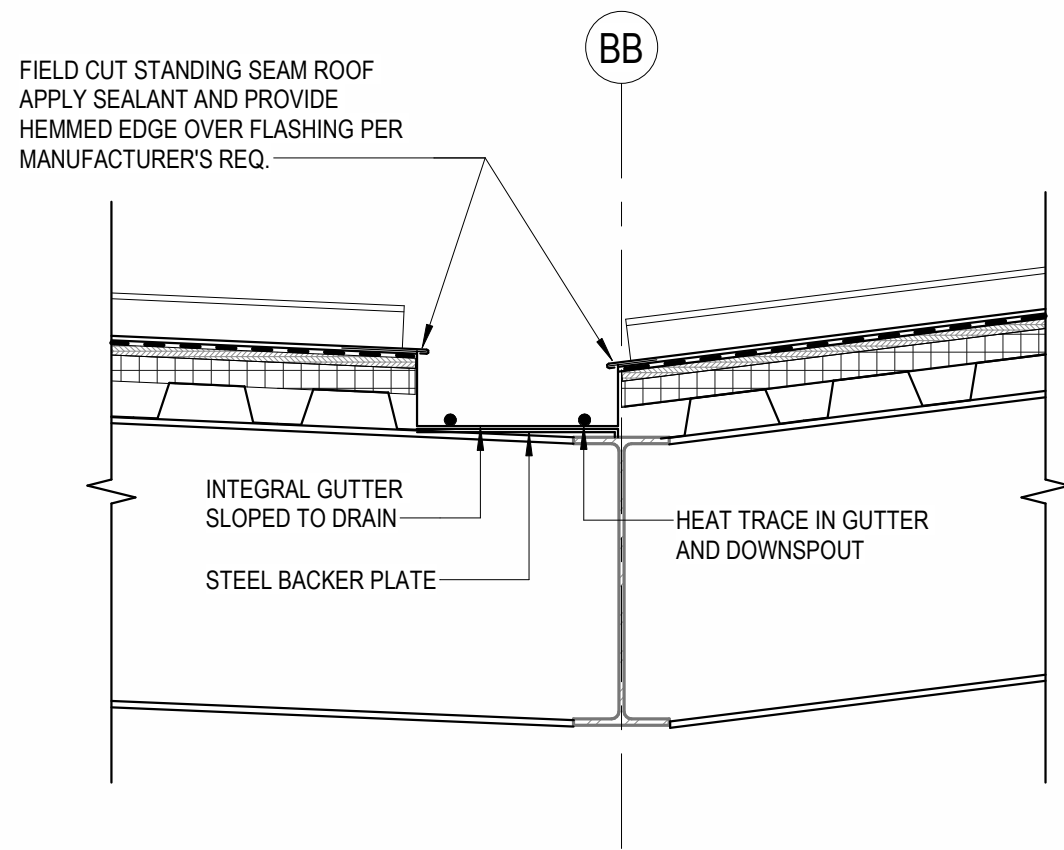
7 BIKE BARN - FRONT ELEVATION  
1/4" = 1'-0"



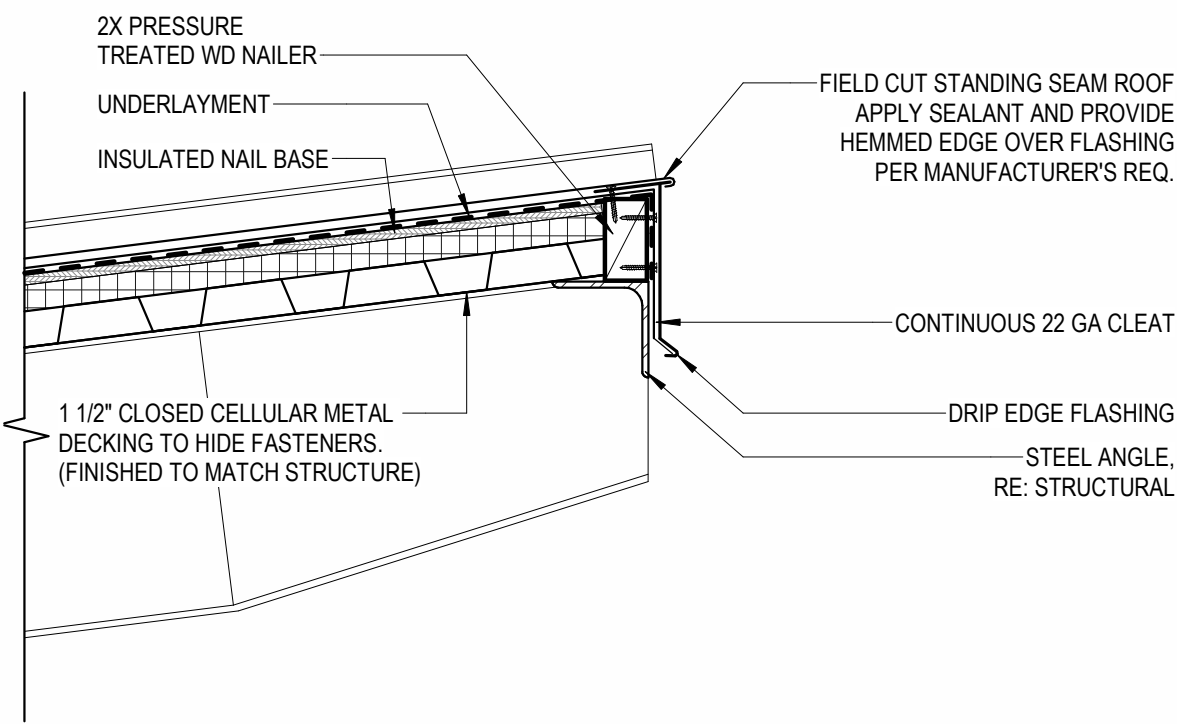
6 BIKE BARN - SIDE ELEVATION  
1/4" = 1'-0"



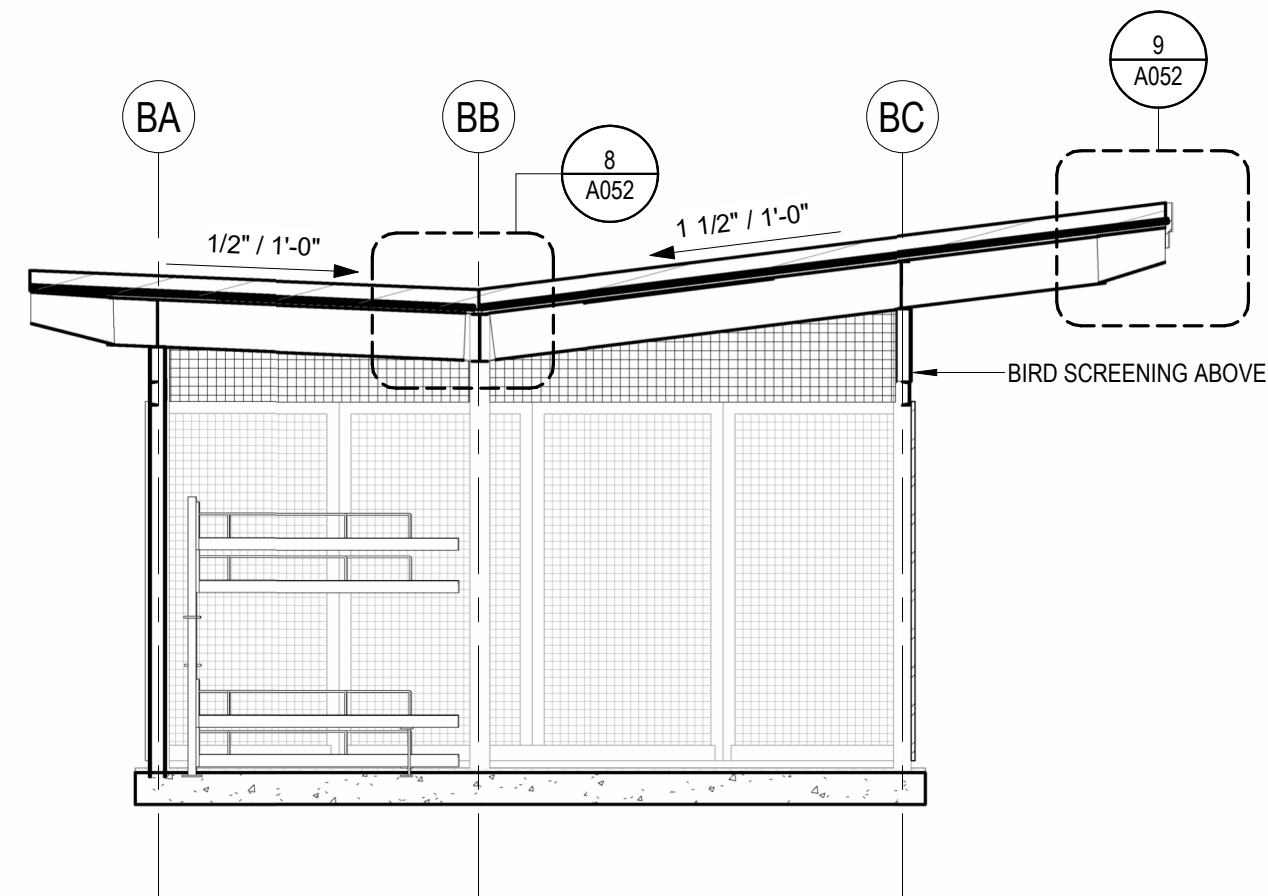
5 BIKE BARN - REAR ELEVATION  
1/4" = 1'-0"



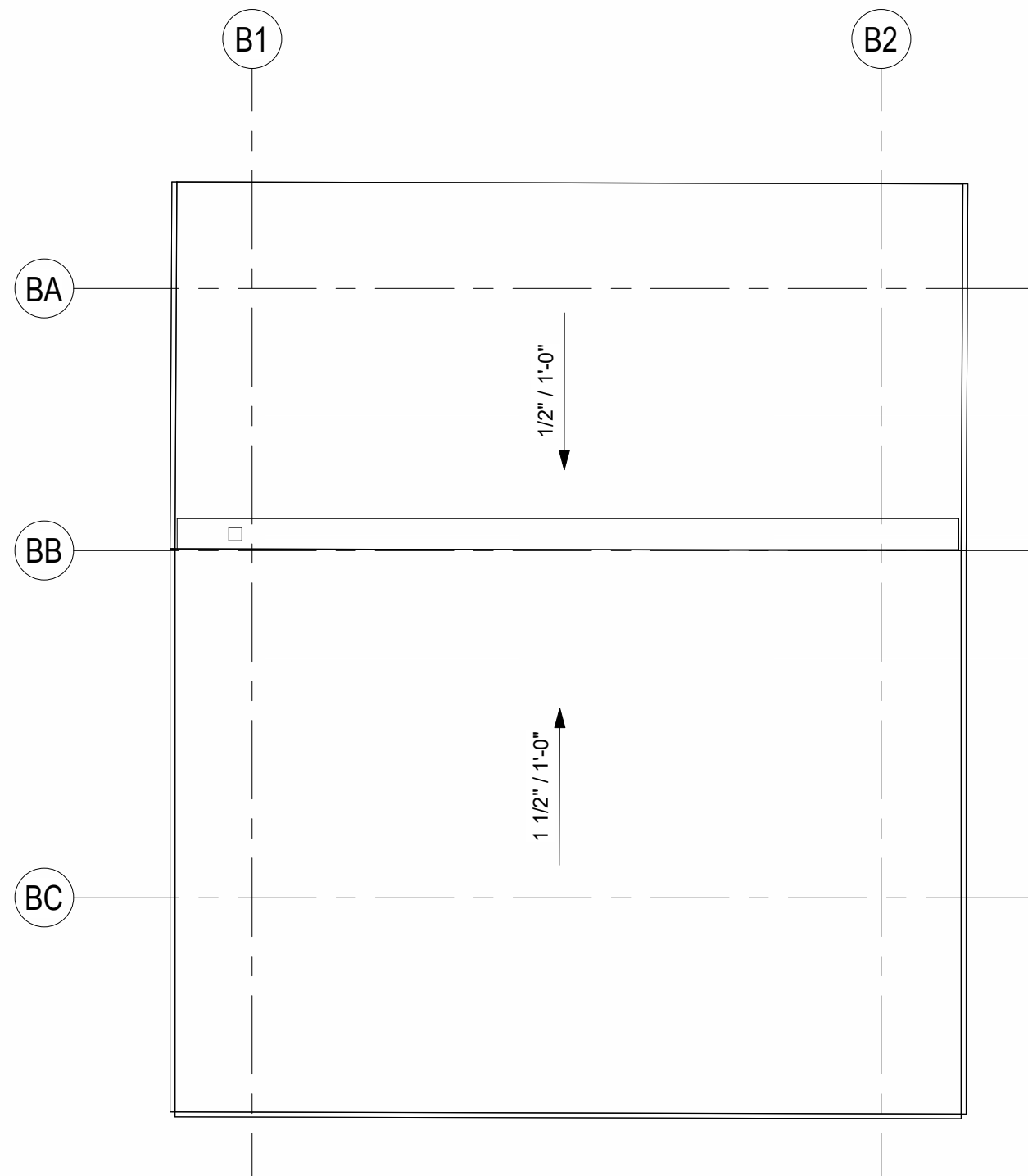
8 BIKE BARN - ROOF VALLEY  
1 1/2" = 1'-0"



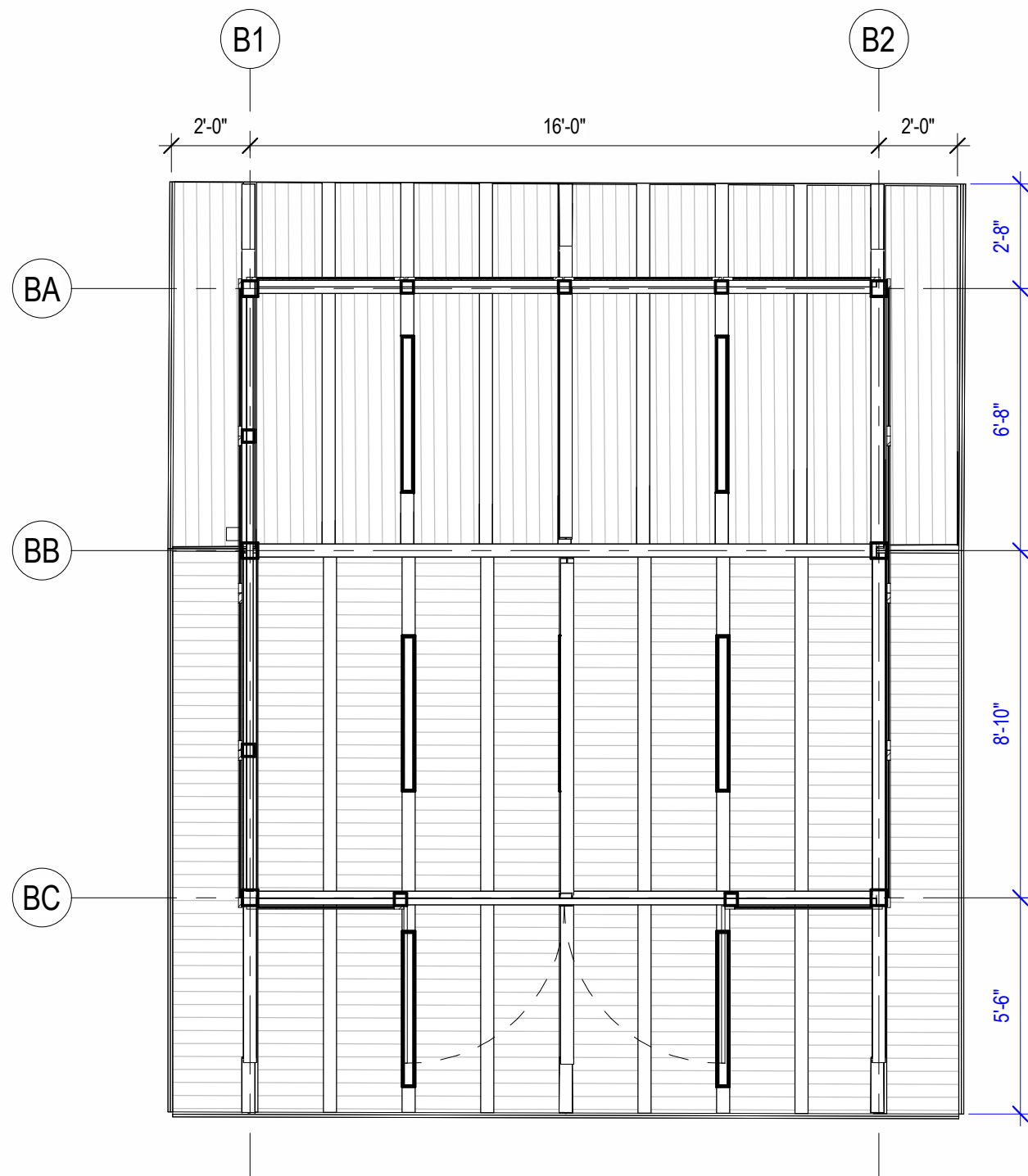
9 BIKE BARN - ROOF EDGE  
1 1/2" = 1'-0"



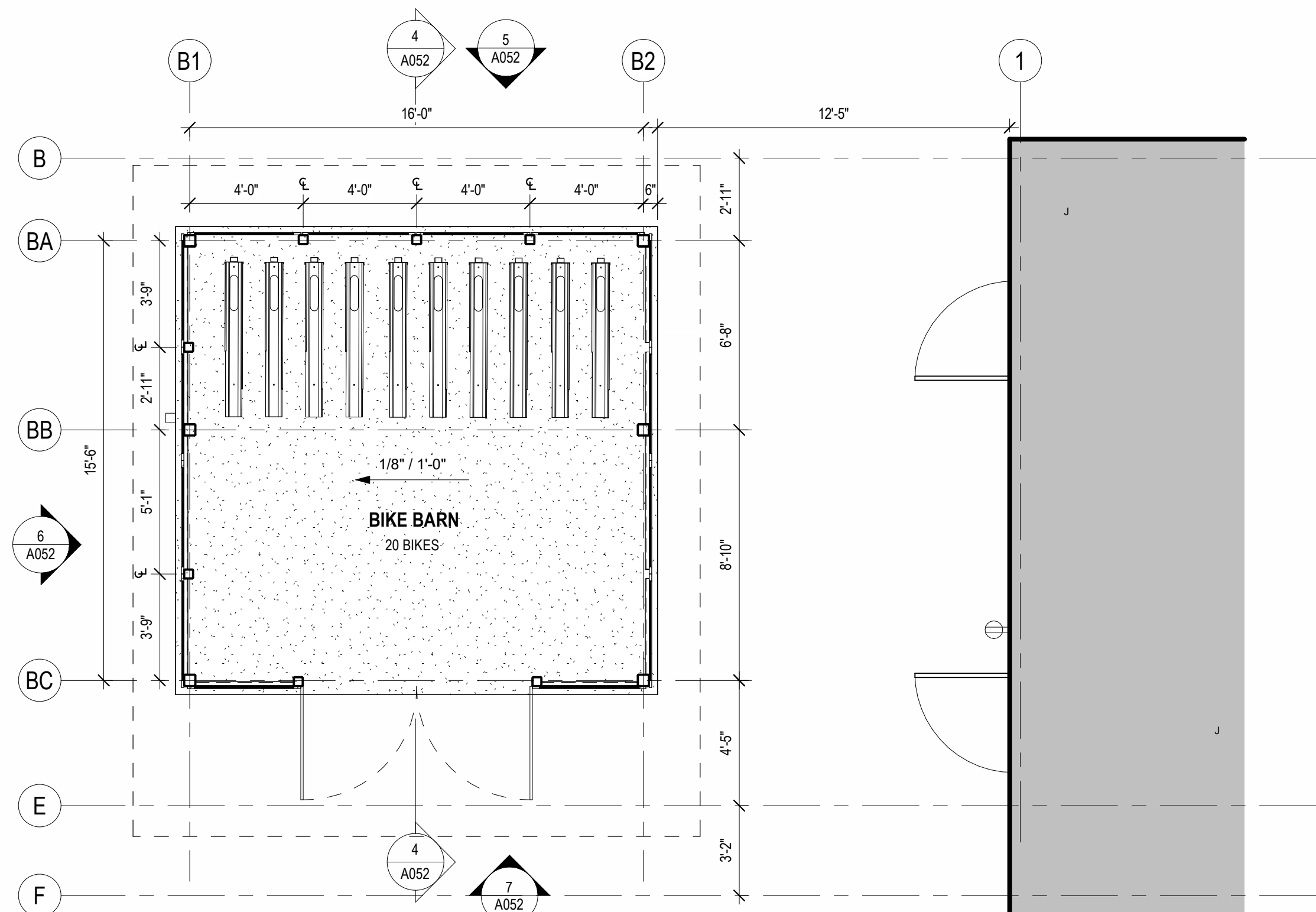
4 BIKE BARN - SECTION  
1/4" = 1'-0"



3 BIKE BARN - ROOF PLAN  
1/4" = 1'-0"



2 BIKE BARN - RCP  
1/4" = 1'-0"



1 BIKE BARN - ENLARGED PLAN  
1/4" = 1'-0"



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BIKE BARN ENLARGED  
PLANS AND ELEVATIONS  
(PH-6A)

A052





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TRANSIT STATION FLOOR  
PLAN (PH-6A)

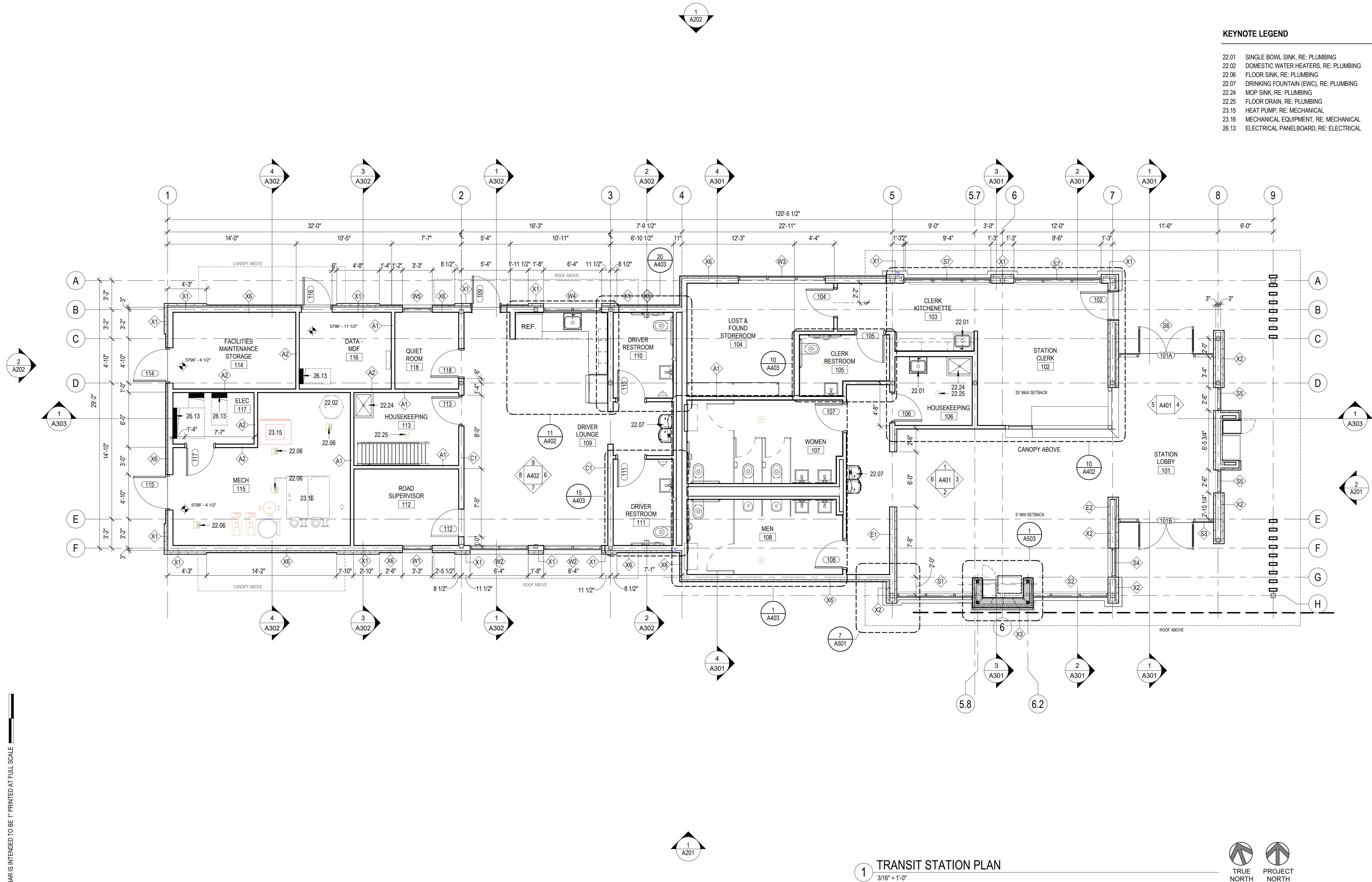
# A101

## GENERAL NOTES

1. FIELD VERIFY ALL DIMENSIONS. NOTIFY ARCHITECT IF DIMENSIONS VARY SIGNIFICANTLY.
2. ALL DIMENSIONS TO FACE OF STEEL STUD OR CENTERLINE OF STRUCTURE UNLESS NOTED OTHERWISE.

## KEYNOTE LEGEND

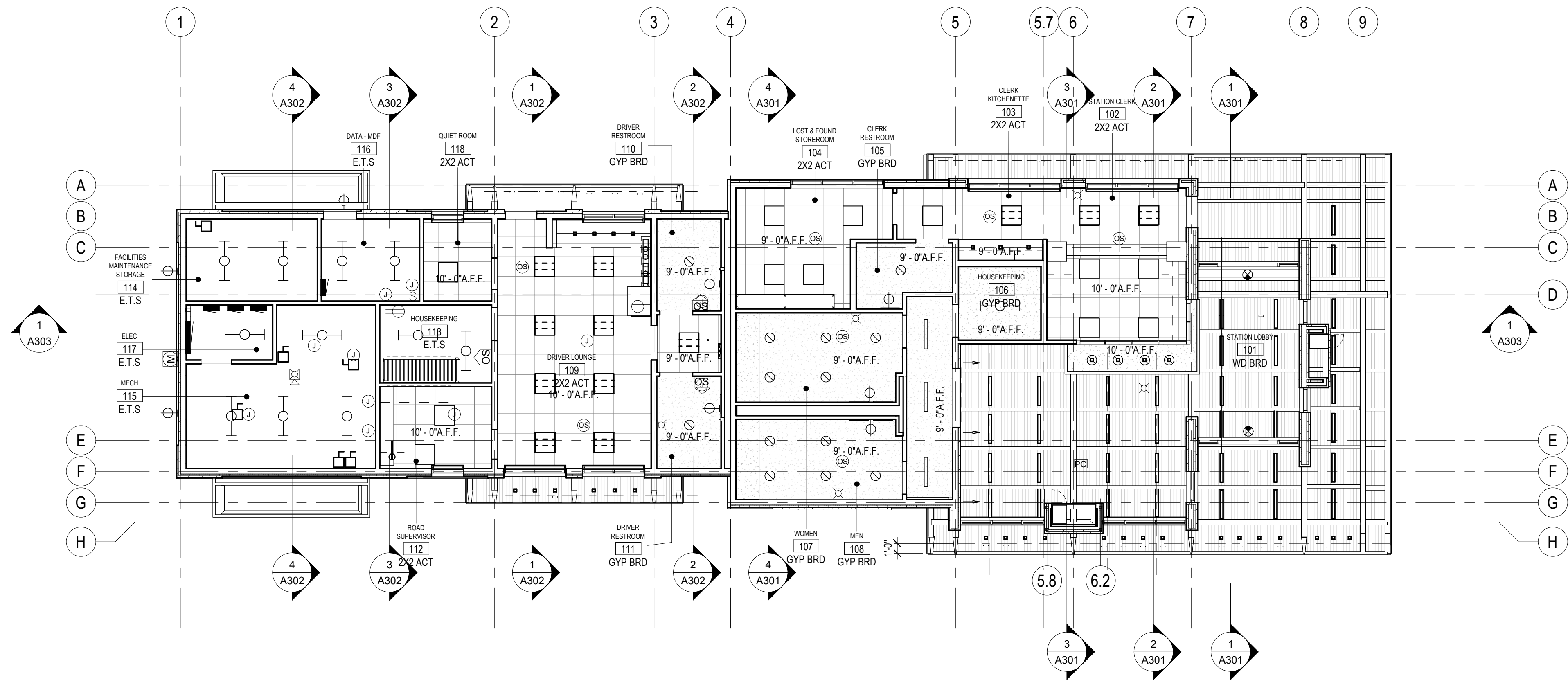
- |       |                                       |
|-------|---------------------------------------|
| 22.01 | SINGLE BOWL SINK, RE: PLUMBING        |
| 22.02 | DOMESTIC WATER HEATERS, RE: PLUMBING  |
| 22.06 | FLOOR SINK, RE: PLUMBING              |
| 22.07 | DRINKING FOUNTAIN (EWC), RE: PLUMBING |
| 22.24 | MOP SINK, RE: PLUMBING                |
| 22.25 | FLOOR DRAIN, RE: PLUMBING             |
| 23.15 | HEAT PUMP, RE: MECHANICAL             |
| 23.16 | MECHANICAL EQUIPMENT, RE: MECHANICAL  |
| 26.13 | ELECTRICAL PANELBOARD, RE: ELECTRICAL |



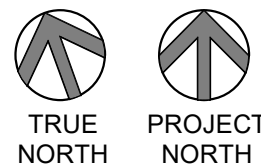
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1 TRANSIT STATION REFLECTED CEILING PLAN  
1/8" = 1'-0"



- GENERAL NOTES
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  2. ALL DIMENSIONS TO FACE OF STEEL STUD OR CENTERLINE OF STRUCTURE UNLESS NOTED OTHERWISE.

KEYNOTE LEGEND

- REFLECTED CEILING LEGEND
- GYPSUM BOARD
  - 2' x 2' SUSPENDED ACOUSTICAL PANELS
  - CONCRETE
  - WOOD BOARD CEILING
  - E.T.S. EXPOSED TO STRUCTURE
  - 3' x 4' LINEAR LIGHT FIXTURE
  - EXIT SIGN
  - 2' x 2' RECESSED LIGHTING TROFFER
  - 8' x 5' LINEAR LIGHT FIXTURE
  - PENDANT LIGHT FIXTURE
  - 1' x 4' CABLE HUNG LIGHT FIXTURE
  - RECESSED CAN LIGHT FIXTURE
  - WALL MOUNTED LIGHT FIXTURE

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ROARING FORK TRANSPORTATION AUTHORITY  
WEST GLENWOOD TRANSIT CENTER  
(PHASE 6A)

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TRANSIT STATION  
REFLECTED CEILING PLAN  
(PH-6A)

A102



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**WEST GLENWOOD TRANSIT CENTER**  
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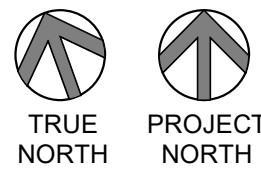
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[illegible]

# A103

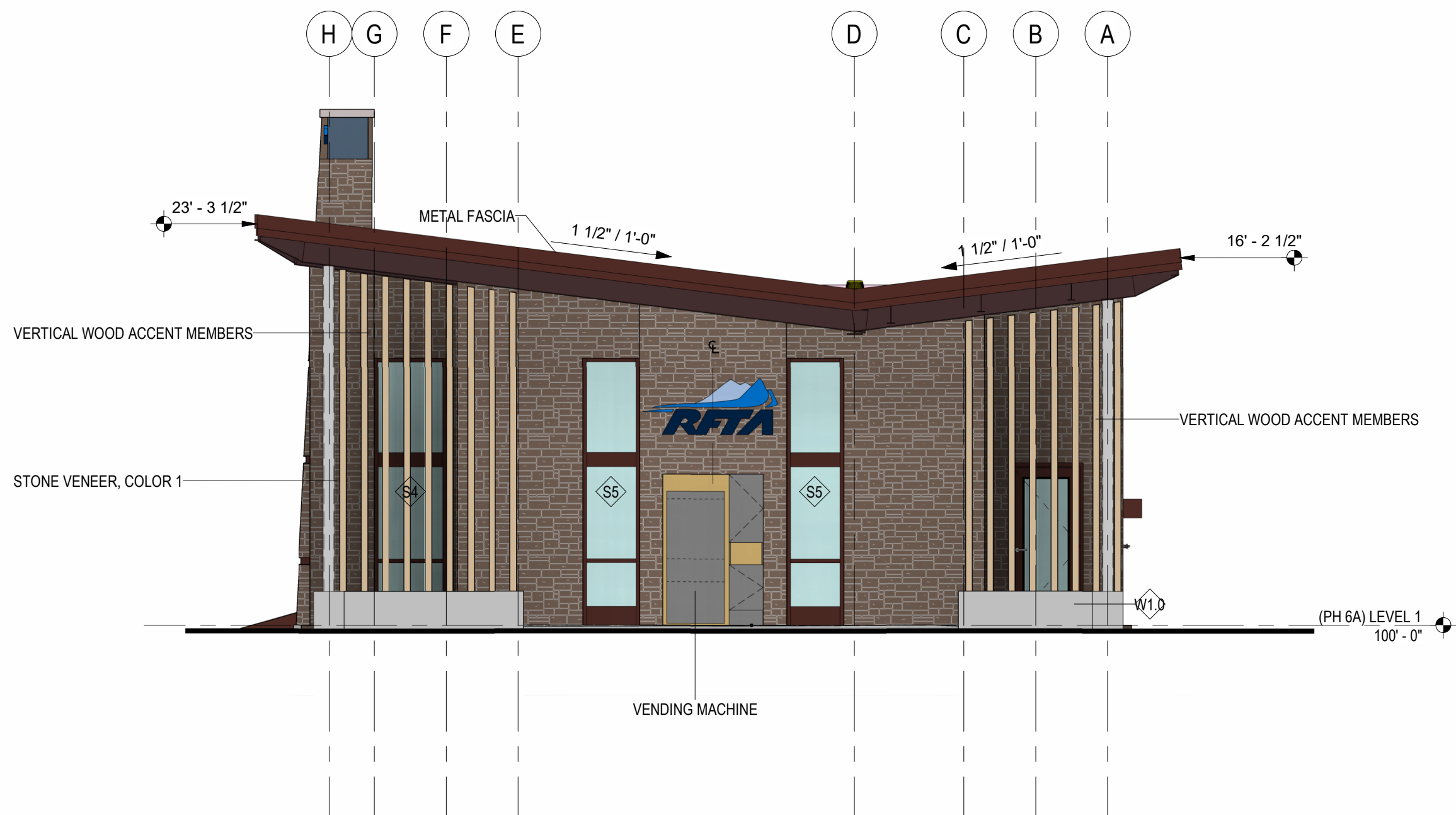
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|       |                                        |
|-------|----------------------------------------|
| 05.03 | METAL FRAMED CANOPY, RE: STRUCTURAL    |
| 05.11 | ACCESS LADDER                          |
| 22.13 | ROOF DRAIN, RE: PLUMBING               |
| 22.17 | ROOF DRAIN WITH OVERFLOW, RE: PLUMBING |

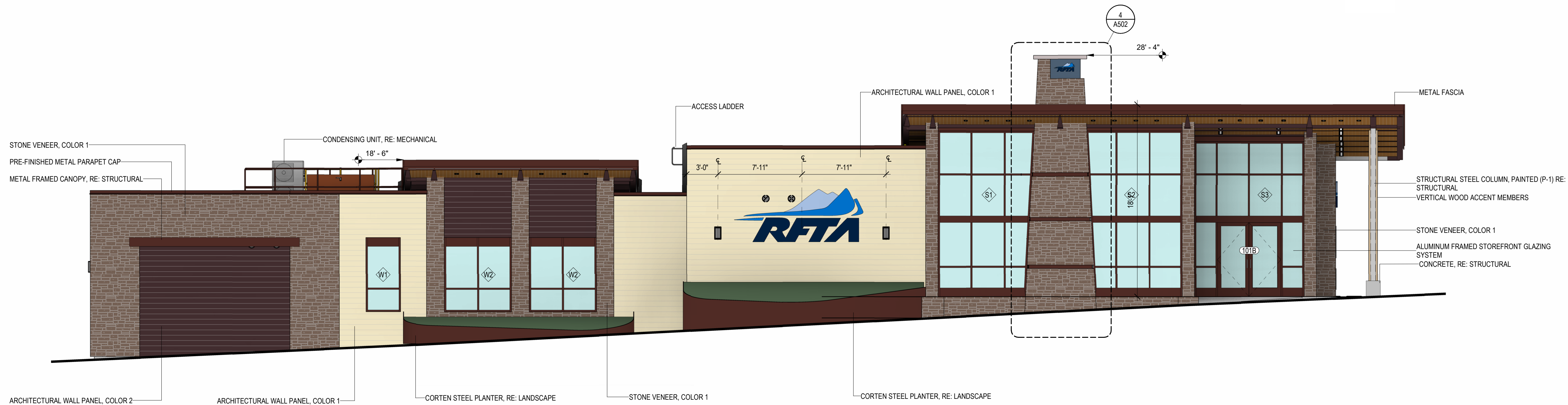




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2 EXTERIOR ELEVATION - EAST  
A101 3/16" = 1'-0"



1 EXTERIOR ELEVATION - SOUTH  
A101 3/16" = 1'-0"

#### GENERAL NOTES

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#### KEYNOTE LEGEND

- 03.01 CONCRETE, RE: STRUCTURAL
- 04.01 ARCHITECTURAL WALL PANEL, COLOR 1
- 04.02 ARCHITECTURAL WALL PANEL, COLOR 2
- 04.04 STONE VENEER, COLOR 1
- 05.02 STRUCTURAL STEEL COLUMN, PAINTED (P-1) RE: STRUCTURAL
- 05.03 METAL FRAMED CANOPY, RE: STRUCTURAL
- 05.08 CORTEN STEEL PLANTER, RE: LANDSCAPE
- 05.09 METAL FASCIA
- 05.11 ACCESS LADDER
- 06.03 VERTICAL WOOD ACCENT MEMBERS
- 07.01 PRE-FINISHED METAL PARAPET CAP
- 08.03 ALUMINUM FRAMED STOREFRONT GLAZING SYSTEM
- 11.04 VENDING MACHINE
- 23.09 CONDENSING UNIT, RE: MECHANICAL

#### EXTERIOR FINISH LEGEND

- STONE VENEER, COLOR 1: CORONADO , VENETIAN VILLA, PALAZZO WITH 1/2" SHALLOW BRUSHED GROUT JOINT. COLOR: MADISON COUNTY.
- ARCHITECTURAL WALL PANEL, COLOR 1: NICHIIA, LATURA V-GROOVE. COLOR: CUSTOM, LIGHT BEIGE
- ARCHITECTURAL WALL PANEL, COLOR 2: NICHIIA, VINTAGE WOOD. COLOR: TABACCO
- RULON FAUX WOOD SOFFIT CEILING, ENDURE LINEAR 800/810 8X0 (3-1/4" WIDTH), WITH 3/4" SPACERS. COLOR: MEDIUM WALNUT
- CORTEN STEEL

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## ROARING FORK TRANSPORTATION AUTHORITY WEST GLENWOOD TRANSIT CENTER (PHASE 6A)

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EXTERIOR ELEVATIONS  
(PH-6A)

A201



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ROARING FORK TRANSPORTATION AUTHORITY  
WEST GLENWOOD TRANSIT CENTER  
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EXTERIOR ELEVATIONS  
(PH-6A)

A202

GENERAL NOTES

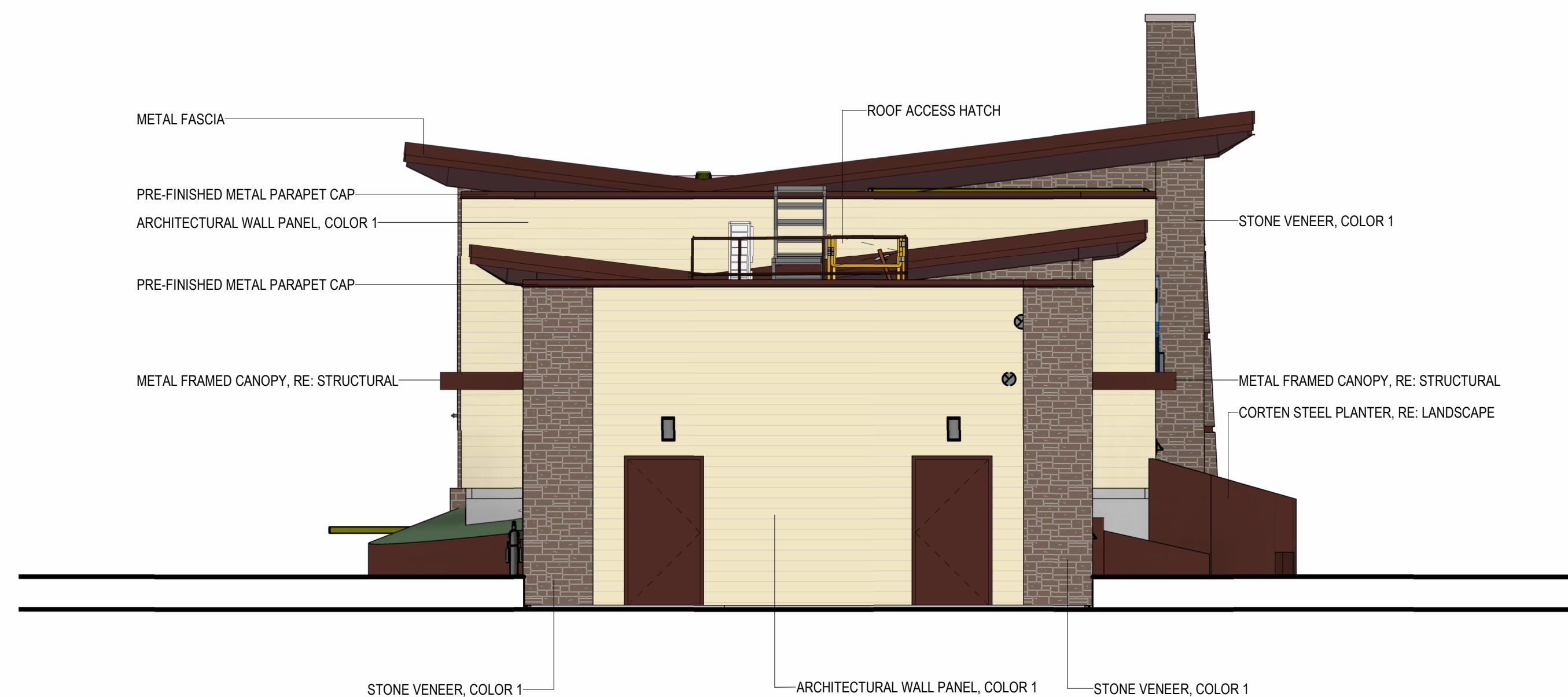
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KEYNOTE LEGEND

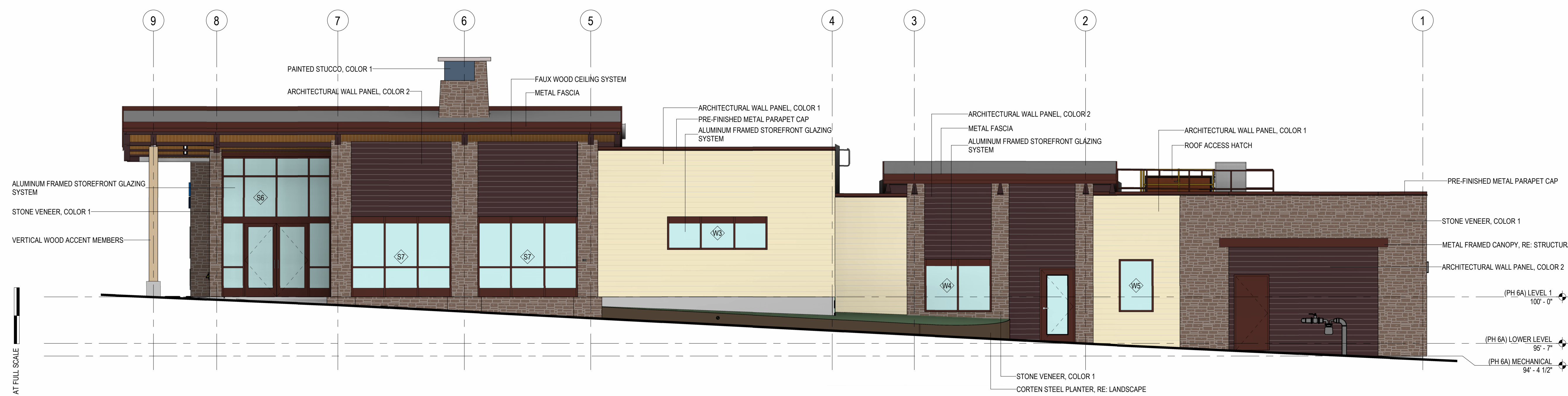
- |       |                                           |
|-------|-------------------------------------------|
| 04.01 | ARCHITECTURAL WALL PANEL, COLOR 1         |
| 04.02 | ARCHITECTURAL WALL PANEL, COLOR 2         |
| 04.04 | STONE VENEER, COLOR 1                     |
| 05.03 | METAL FRAMED CANOPY, RE: STRUCTURAL       |
| 05.06 | ROOF ACCESS HATCH                         |
| 05.08 | CORTEN STEEL PLANTER, RE: LANDSCAPE       |
| 05.09 | METAL FASCIA                              |
| 06.03 | VERTICAL WOOD ACCENT MEMBERS              |
| 07.01 | PRE-FINISHED METAL PARAPET CAP            |
| 08.03 | ALUMINUM FRAMED STOREFRONT GLAZING SYSTEM |
| 09.03 | FAUX WOOD CEILING SYSTEM                  |
| 09.04 | PAINTED STUCCO, COLOR 1                   |

EXTERIOR FINISH LEGEND

- |  |                                                                                                                         |
|--|-------------------------------------------------------------------------------------------------------------------------|
|  | STONE VENEER, COLOR 1: CORONADO , VENETIAN VILLA, PALAZZO WITH 1/2" SHALLOW BRUSHED GROUT JOINT. COLOR: MADISON COUNTY. |
|  | ARCHITECTURAL WALL PANEL, COLOR 1: NICHHA, LATURA V-GROOVE. COLOR: CUSTOM, LIGHT BEIGE                                  |
|  | ARCHITECTURAL WALL PANEL, COLOR 2: NICHHA, VINTAGE WOOD. COLOR: TABACCO                                                 |
|  | RULON FAUX WOOD SOFFIT CEILING, ENDURE LINEAR 800/810 8X0 (3-1/4" WIDTH), WITH 3/4" SPACERS. COLOR: MEDIUM WALNUT       |
|  | CORTEN STEEL                                                                                                            |



2 EXTERIOR ELEVATION - WEST  
3/16" = 1'-0"

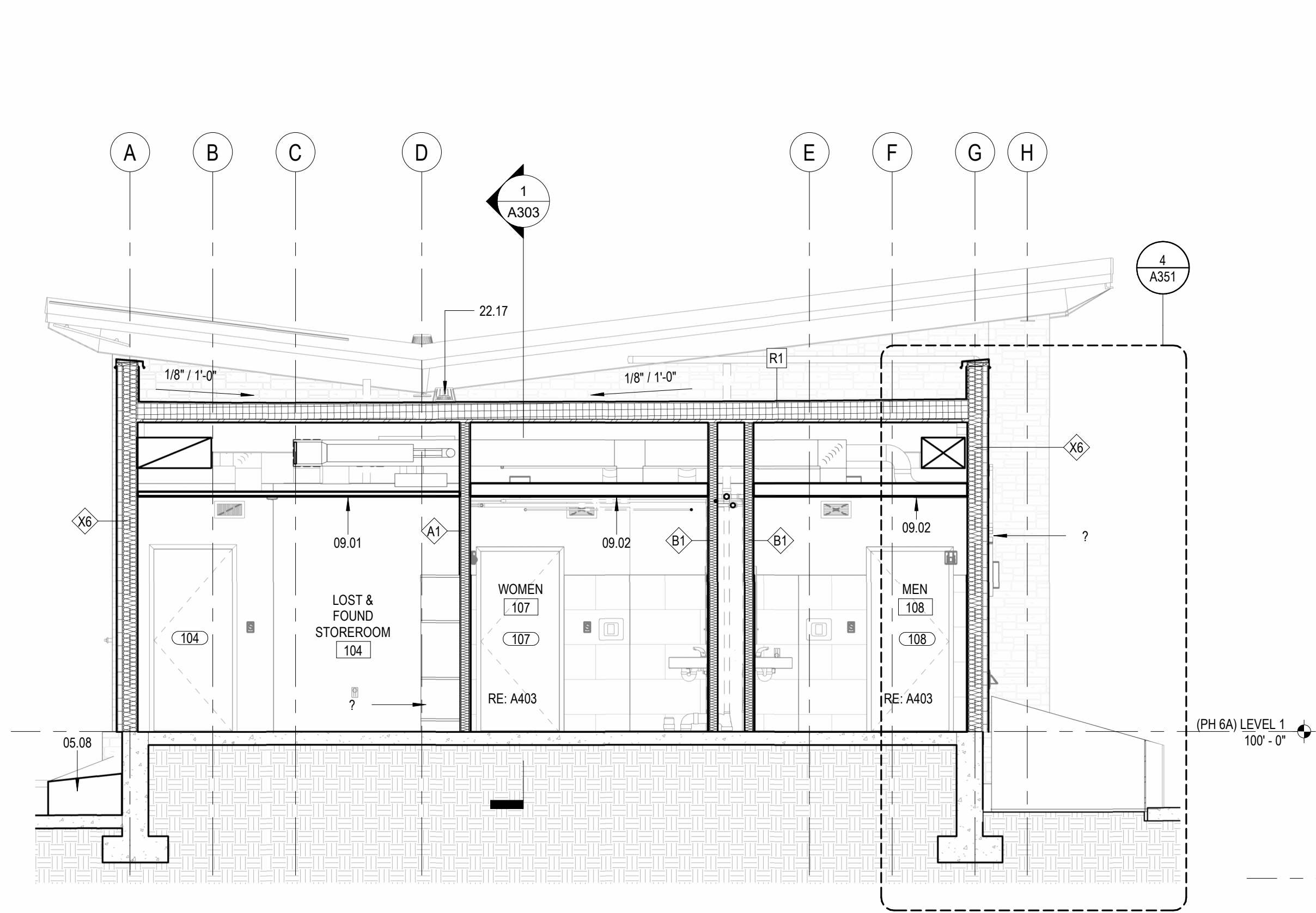


1 EXTERIOR ELEVATION - NORTH  
3/16" = 1'-0"

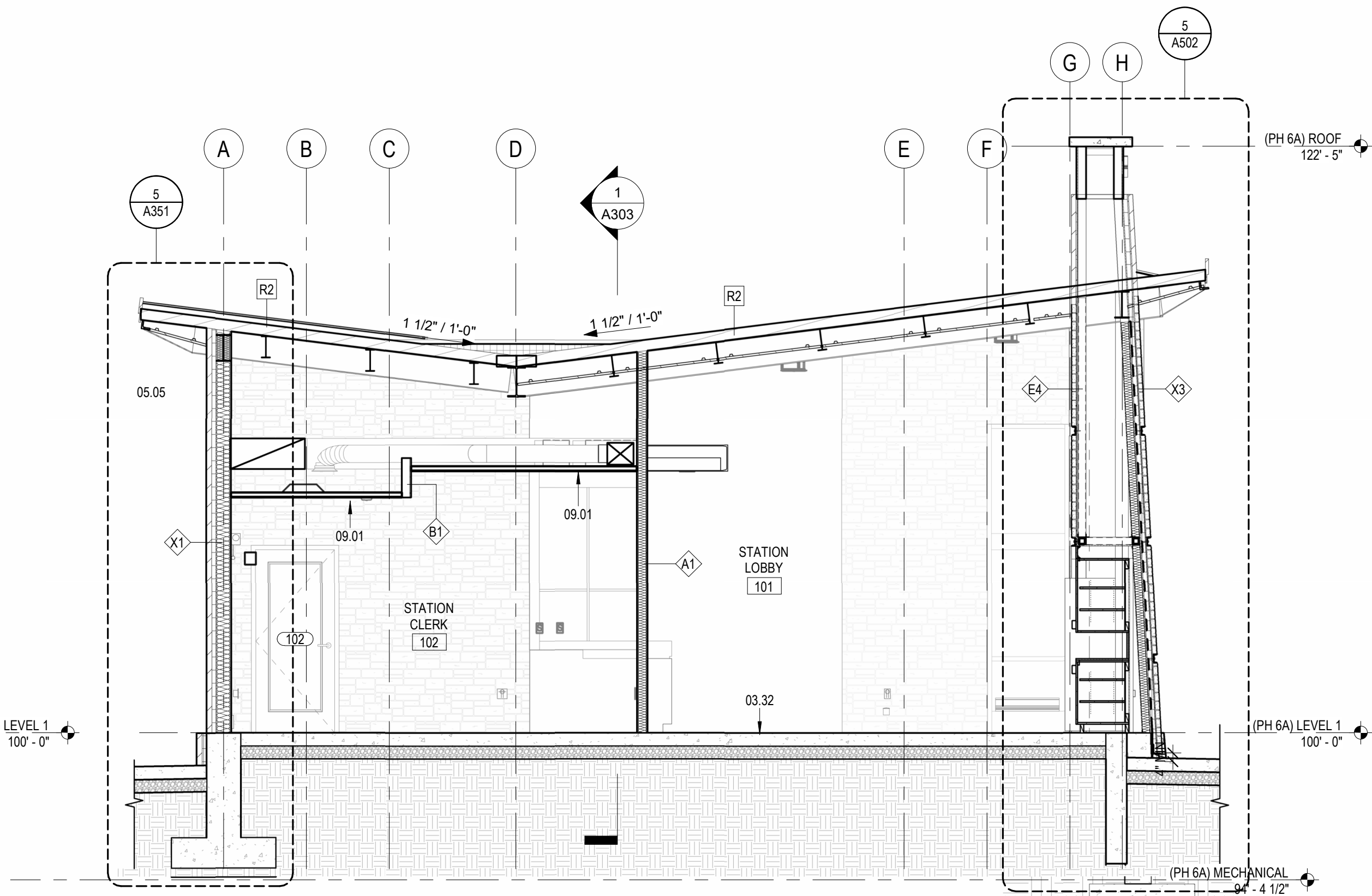
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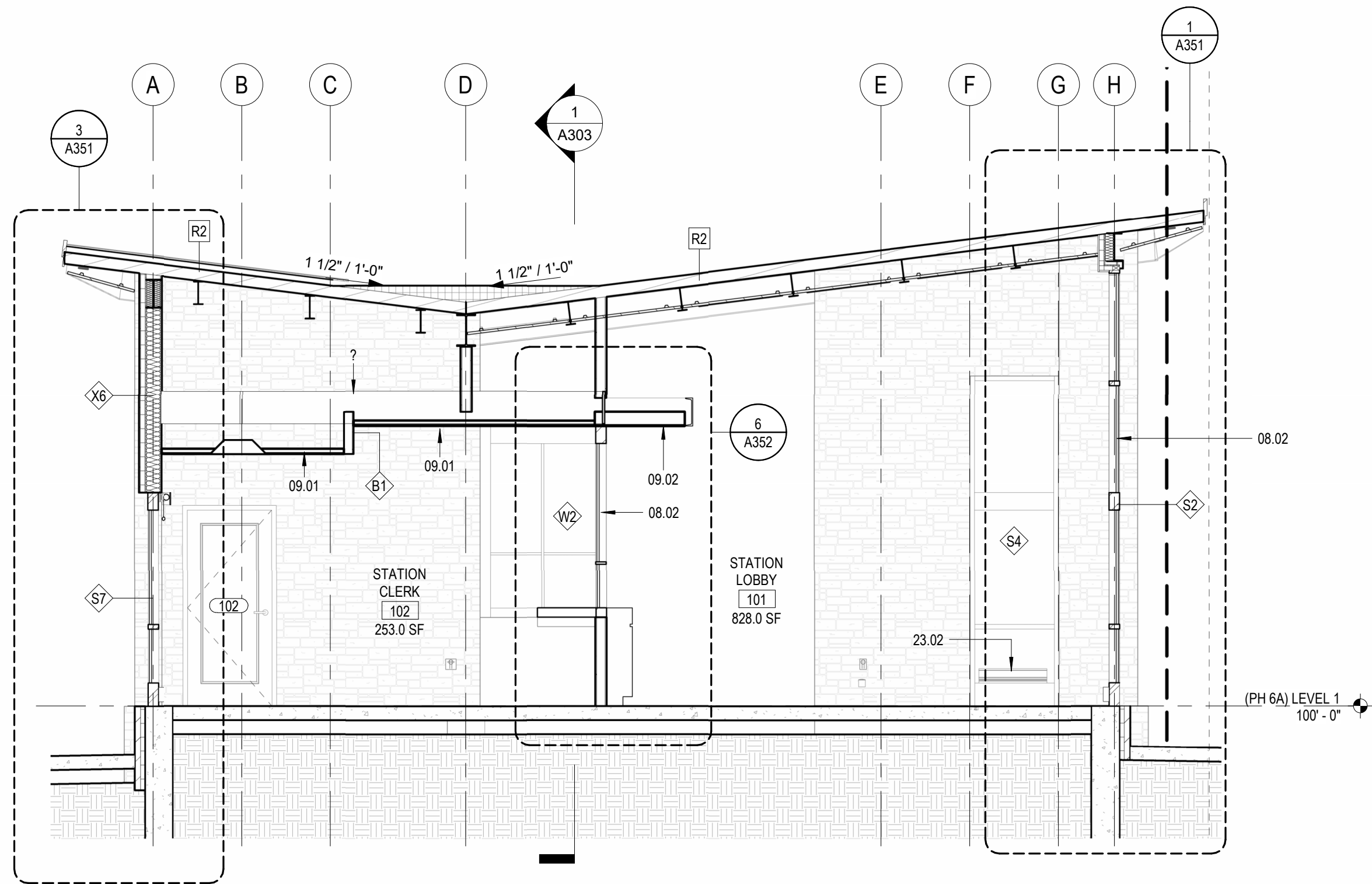
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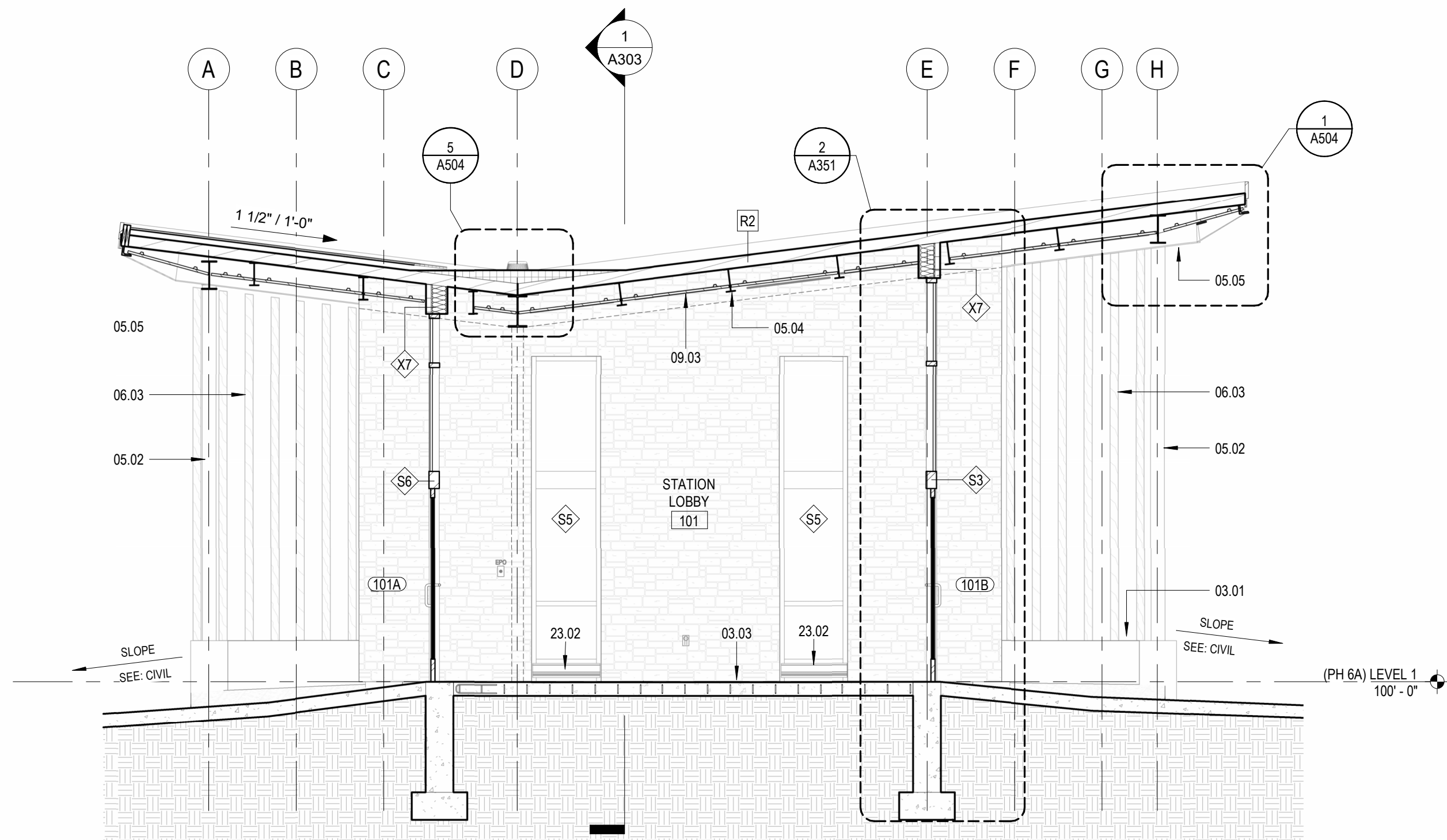
**4** BUILDING SECTION - NS RESTROOMS  
A101 1/4" = 1'-0"



**3** BUILDING SECTION - NS STATION LOBBY  
A101 1/4" = 1'-0"



**2** BUILDING SECTION - NS STATION CLERK  
A101 1/4" = 1'-0"



**1** BUILDING SECTION - NS STATION ENTRY  
A101 1/4" = 1'-0"

GENERAL NOTES

1. FIELD VERIFY ALL DIMENSIONS. NOTIFY ARCHITECT IF DIMENSIONS VARY SIGNIFICANTLY.
2. ALL DIMENSIONS TO FACE OF STEEL STUD OR CENTERLINE OF STRUCTURE UNLESS NOTED OTHERWISE.

KEYNOTE LEGEND

- |       |                                                        |
|-------|--------------------------------------------------------|
| 03.01 | CONCRETE, RE: STRUCTURAL                               |
| 03.03 | CONCRETE SLAB ON GRADE, RE: STRUCTURAL                 |
| 03.32 | STRUCTURAL STEEL COLUMN, PAINTED (P-1) RE: STRUCTURAL  |
| 05.02 | STRUCTURAL STEEL FRAMING, PAINTED (P-1) RE: STRUCTURAL |
| 05.04 | EXPOSED STEEL BEAM, PAINTED (P-1) RE: STRUCTURAL       |
| 05.05 | CORTEN STEEL PLANTER, RE: LANDSCAPE                    |
| 06.03 | VERTICAL WOOD ACCENT MEMBERS                           |
| 08.02 | INSULATED SPANDRAL PANEL                               |
| 09.01 | 2" X 2" ACOUSTICAL CEILING TILE                        |
| 09.02 | 5/8" GYPSUM BOARD SUSPENDED CEILING                    |
| 09.03 | FAUX WOOD CEILING SYSTEM                               |
| 22.17 | ROOF DRAIN WITH OVERFLOW, RE: PLUMBING                 |
| 23.02 | BASEBOARD HEATER, RE: MECHANICAL                       |



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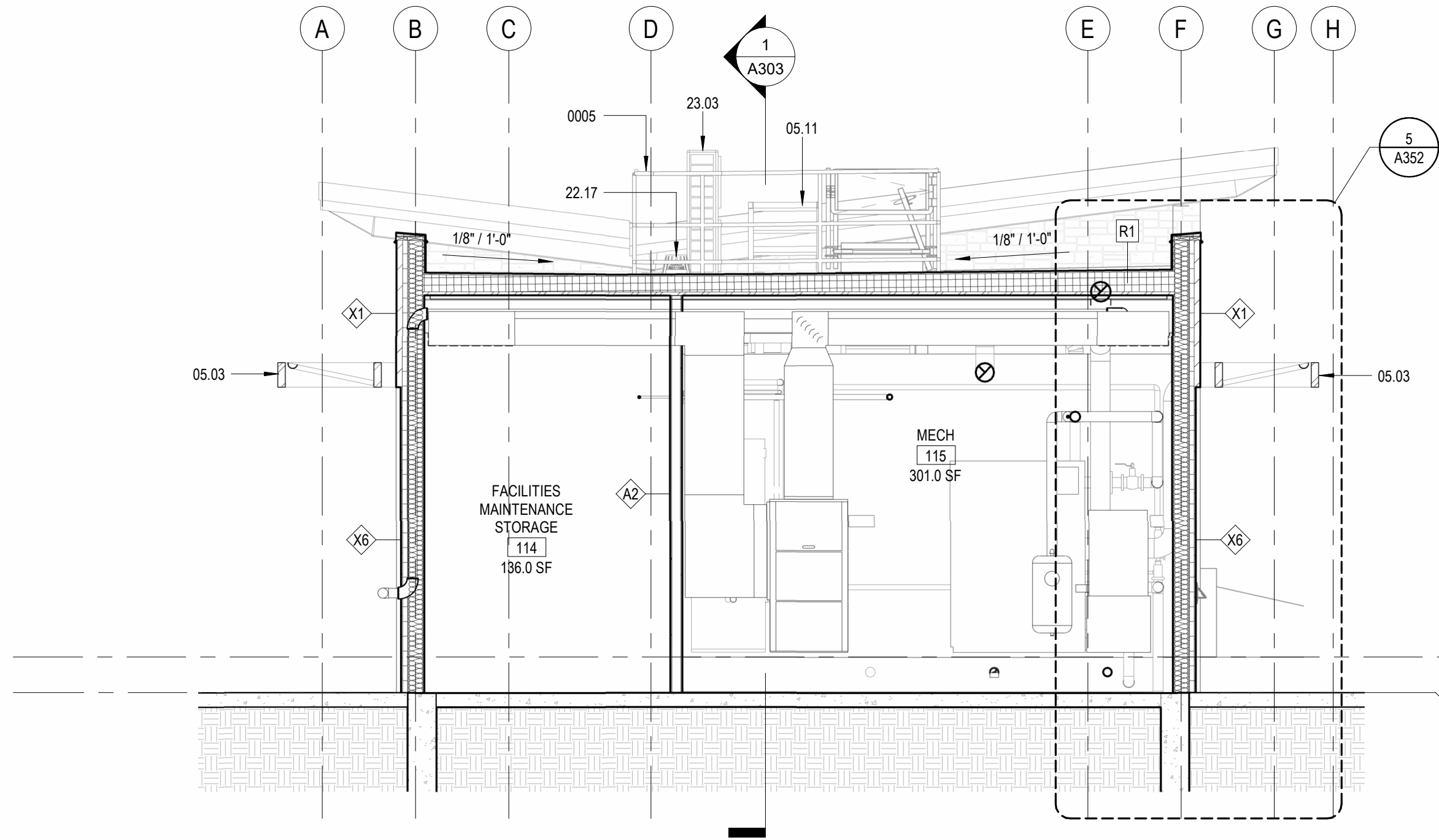
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BUILDING SECTIONS (PH-6A)

A301

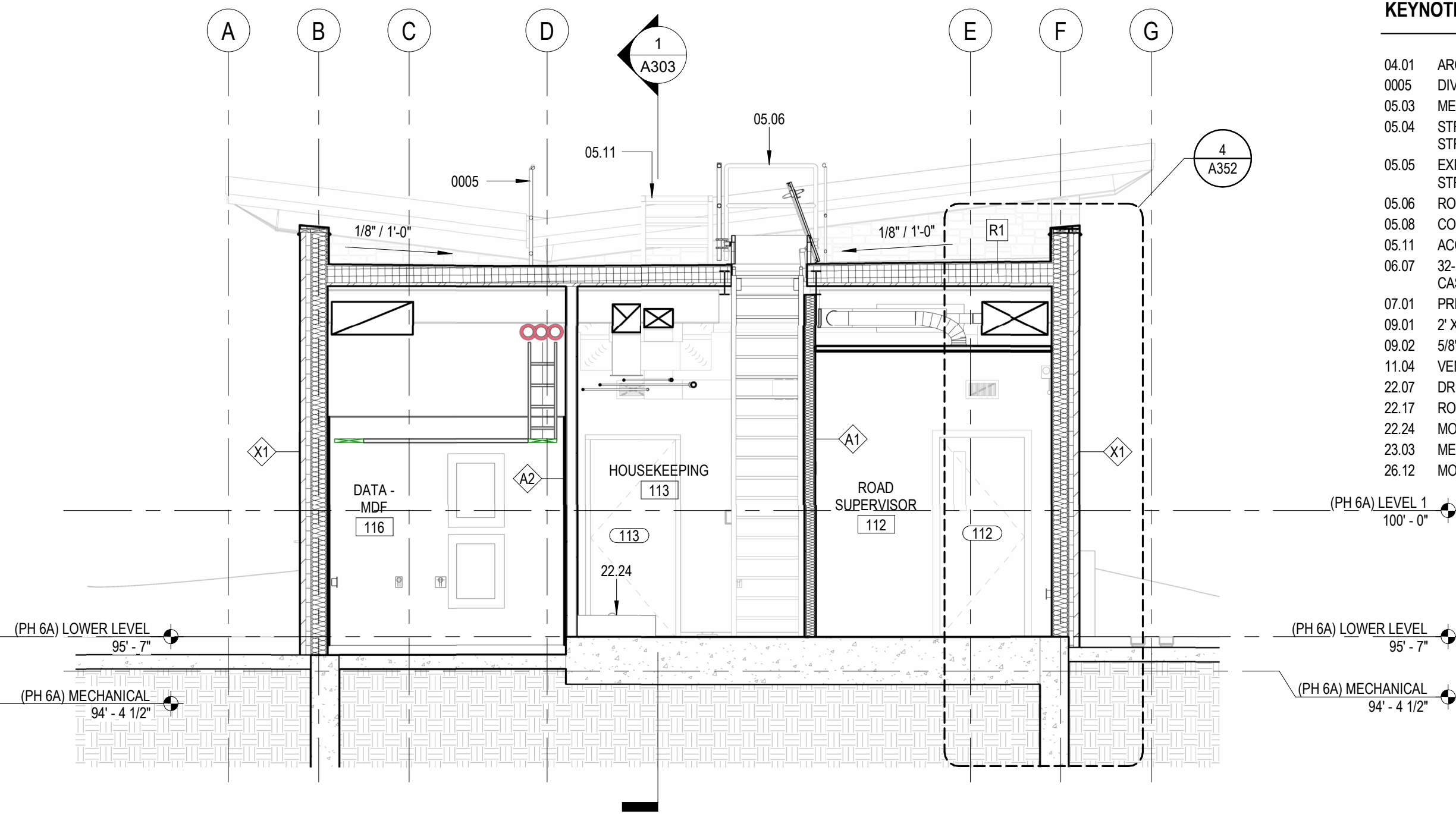


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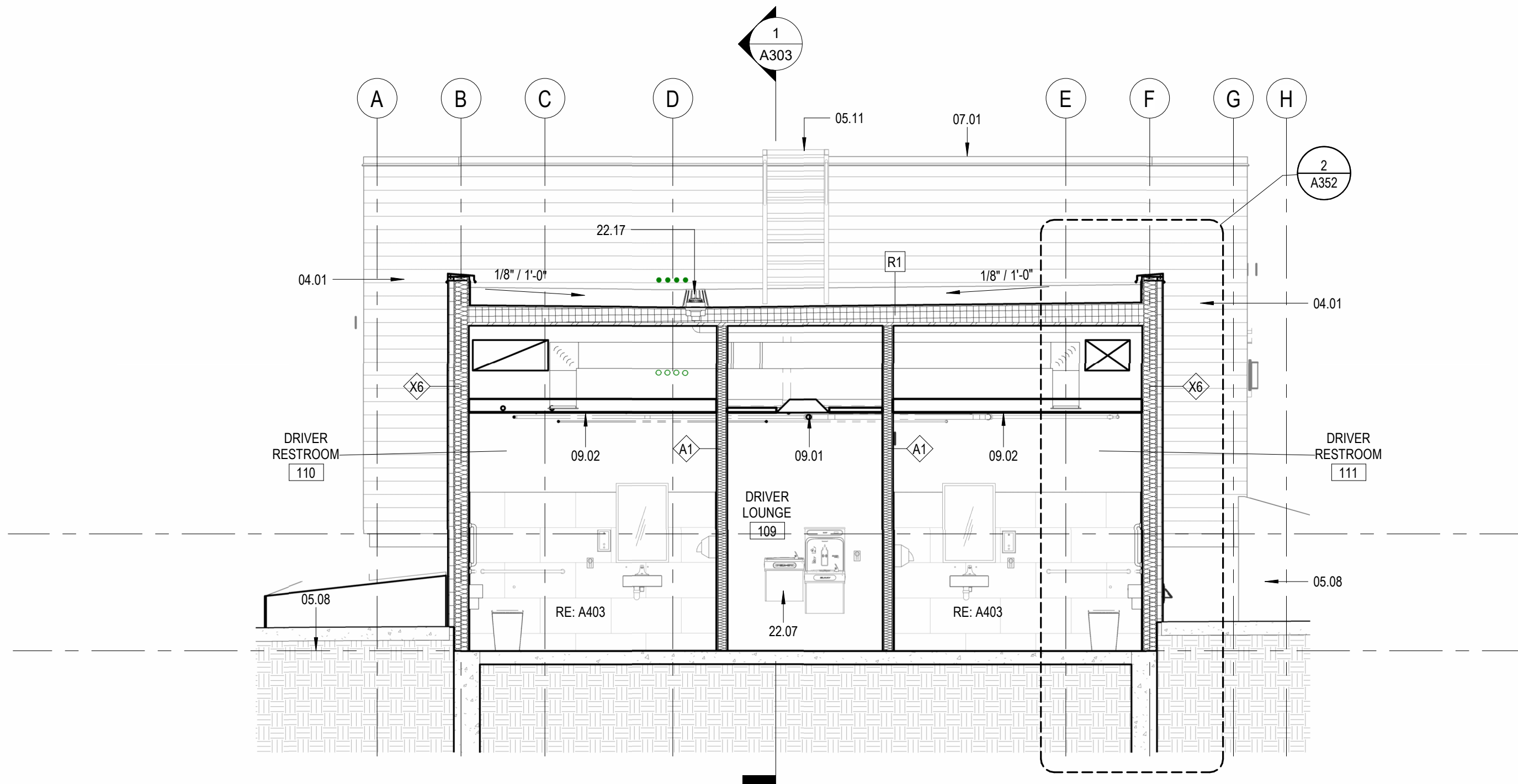
**4**  
A101 1/4" = 1'-0"

BUILDING SECTION - NS STORAGE / MECHANICAL



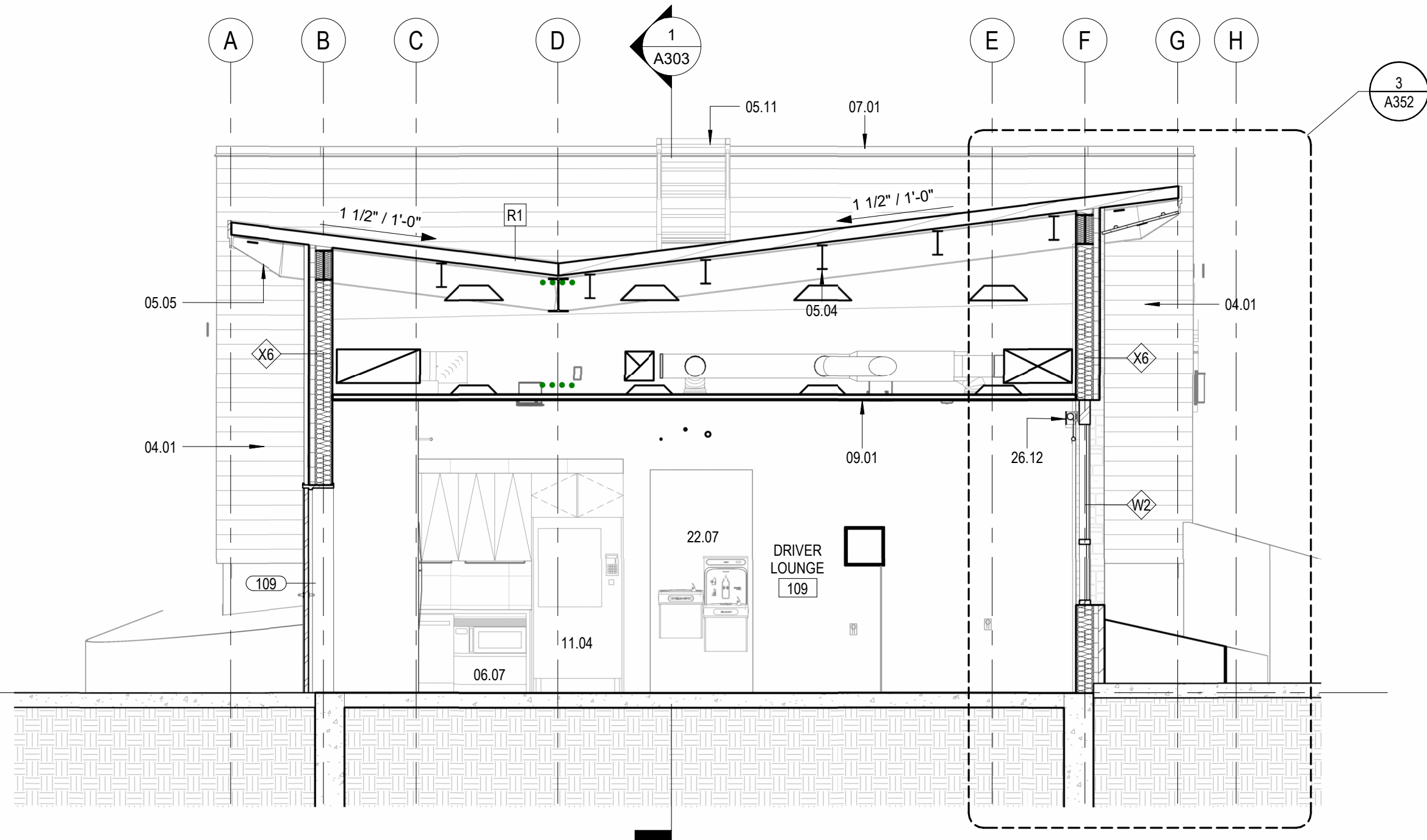
**3**  
A101 1/4" = 1'-0"

BUILDING SECTION - NS ROAD SUPERVISOR



**2**  
A101 1/4" = 1'-0"

BUILDING SECTION - NS DRIVER RESTROOMS



**1**  
A101 1/4" = 1'-0"

BUILDING SECTION - NS DRIVER LOUNGE

GENERAL NOTES

1. FIELD VERIFY ALL DIMENSIONS. NOTIFY ARCHITECT IF DIMENSIONS VARY SIGNIFICANTLY.
2. ALL DIMENSIONS TO FACE OF STEEL STUD OR CENTERLINE OF STRUCTURE UNLESS NOTED OTHERWISE.

KEYNOTE LEGEND

- |       |                                                                             |
|-------|-----------------------------------------------------------------------------|
| 04.01 | ARCHITECTURAL WALL PANEL, COLOR 1                                           |
| 0005  | DIVISION 5 - METALS                                                         |
| 05.03 | METAL FRAMED CANOPY, RE: STRUCTURAL                                         |
| 05.04 | STRUCTURAL STEEL FRAMING, PAINTED (P-1) RE: STRUCTURAL                      |
| 05.05 | EXPOSED STEEL BEAM, PAINTED (P-1) RE: STRUCTURAL                            |
| 05.06 | ROOF ACCESS HATCH                                                           |
| 05.08 | CORTEN STEEL PLANTER, RE: LANDSCAPE                                         |
| 05.11 | ACCESS LADDER                                                               |
| 06.07 | 32-1/2" TALL SINK CABINET W/ APRON. SEE A842 CASEWORK DETAILS. RE: PLUMBING |
| 07.01 | PRE-FINISHED METAL PARAPET CAP                                              |
| 09.01 | 2' X 2' ACOUSTICAL CEILING TILE                                             |
| 09.02 | 5/8" GYPSUM BOARD SUSPENDED CEILING                                         |
| 11.04 | VENDING MACHINE                                                             |
| 22.07 | DRINKING FOUNTAIN (EWC), RE: PLUMBING                                       |
| 22.17 | ROOF DRAIN WITH OVERFLOW, RE: PLUMBING                                      |
| 22.24 | MOP SINK, RE: PLUMBING                                                      |
| 23.03 | MECHANICAL EQUIPMENT WITH SCREEN WALL                                       |
| 26.12 | MOTORIZED ROLLER SHADE, RE: ELECTRICAL                                      |

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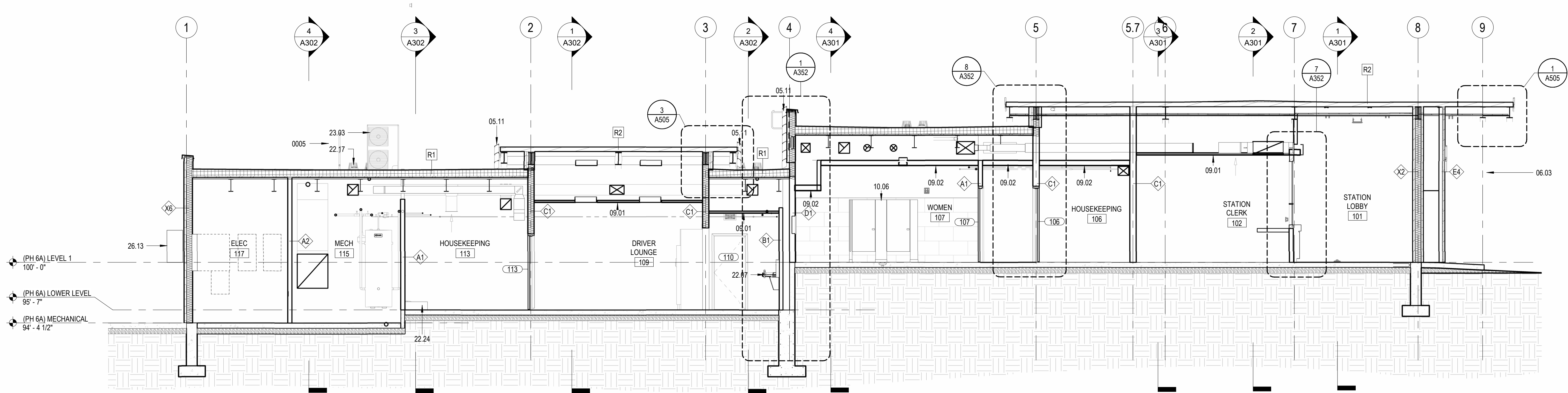
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BUILDING SECTIONS (PH-6A)

A302



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1 BUILDING SECTION - E/W  
3/16" = 1'-0"



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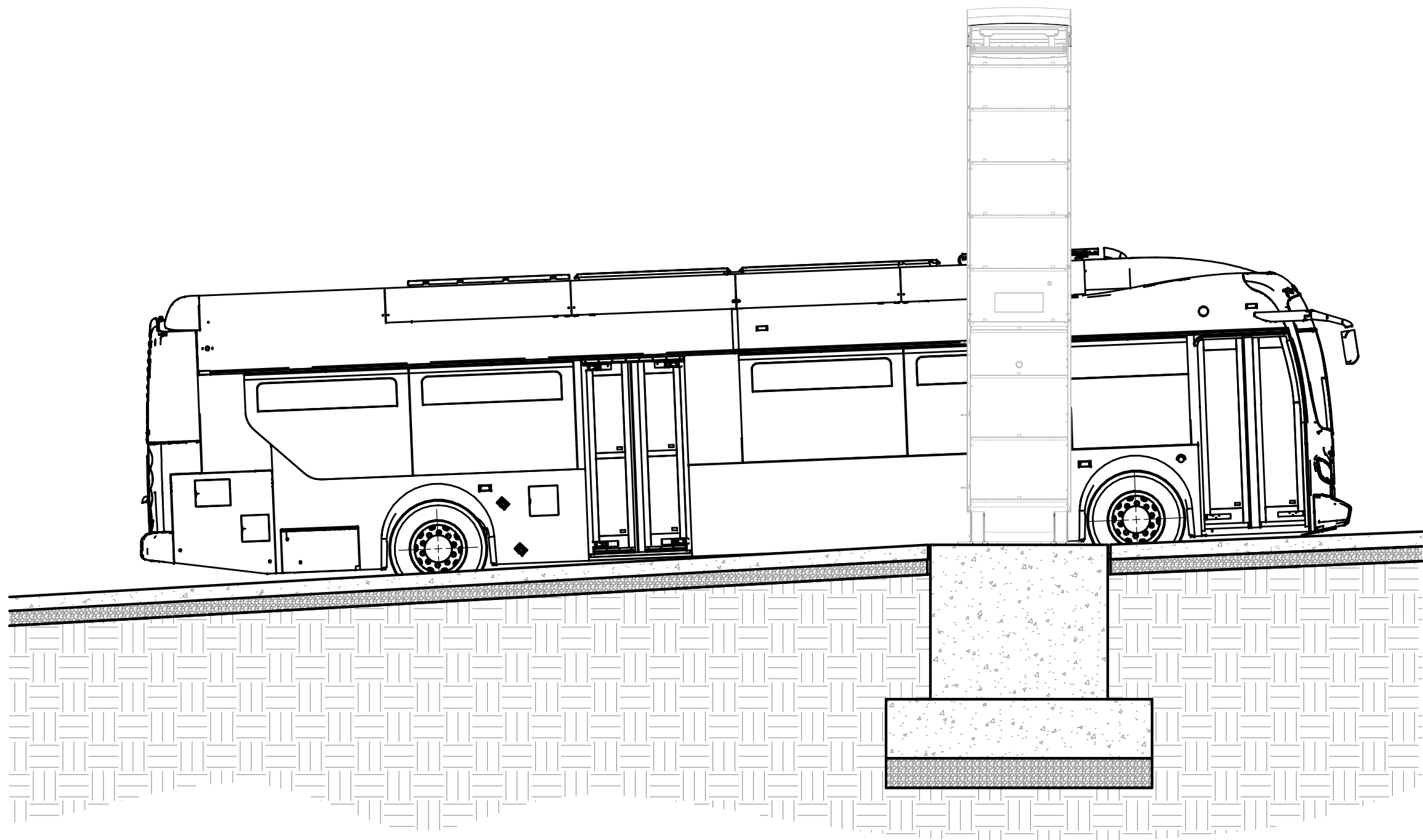
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BUILDING SECTIONS (PH-6A)

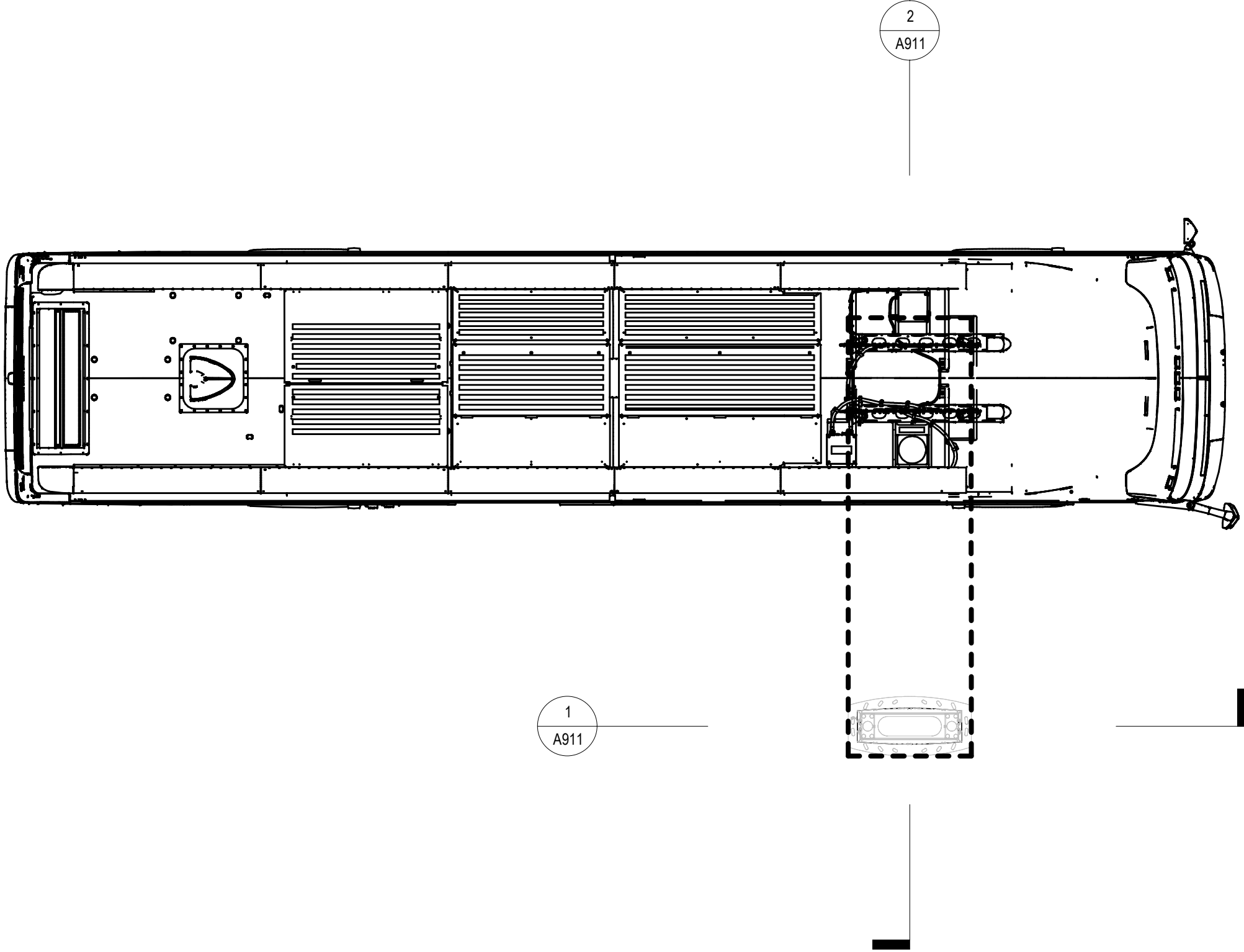
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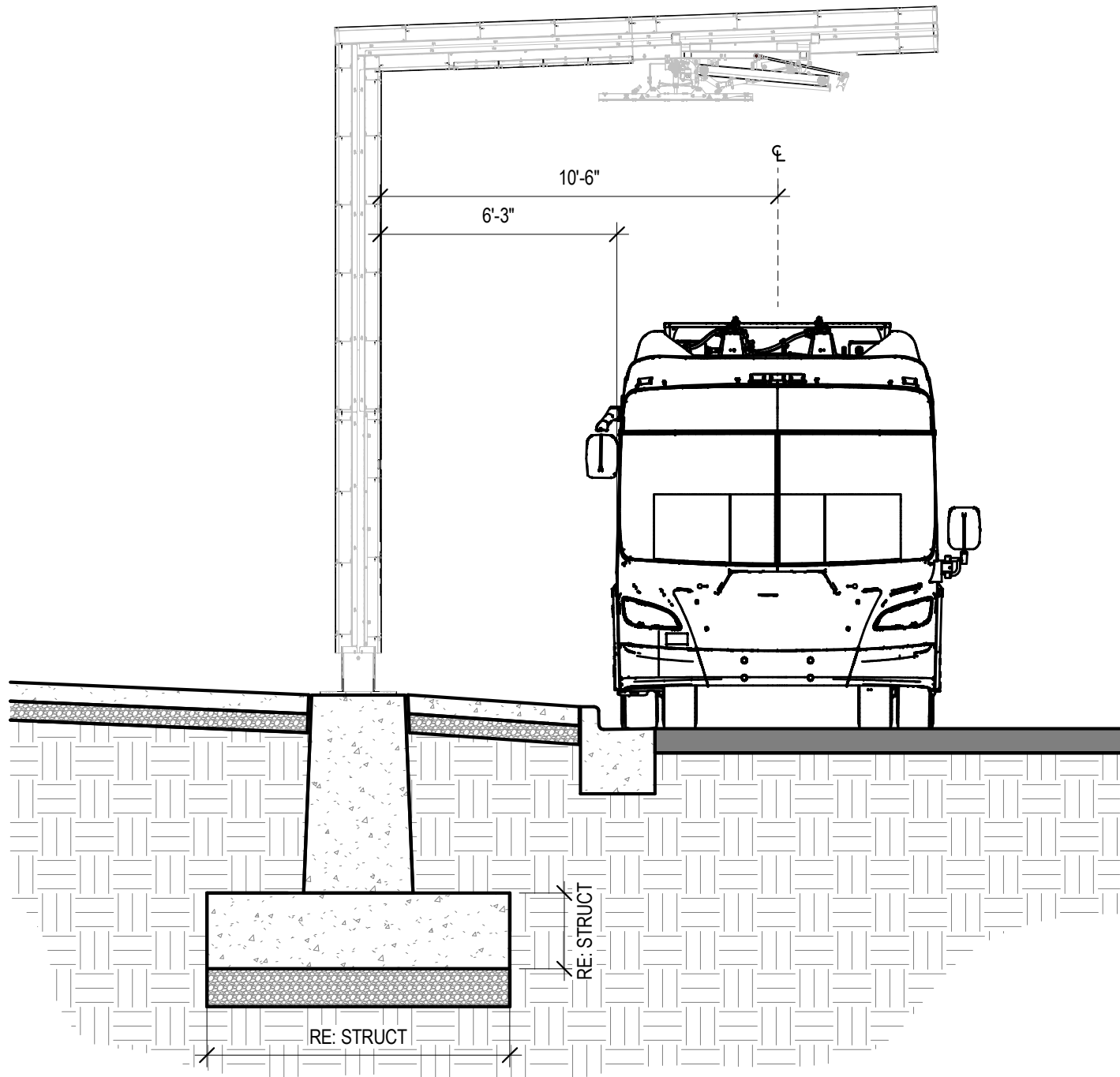
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1 SECTION - BUS CHARGING E/W (TYP.)  
1/4" = 1'-0"



3 ENLARGED PLAN - BUS CHARGING (TYP.)  
1/4" = 1'-0"



2 SECTION - BUS CHARGING N/S (TYP.)  
1/4" = 1'-0"



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BUS CHARGER ENLARGED  
PLAN & SECTIONS

A911



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PERSPECTIVES (PH-6A)

A961



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PERSPECTIVES (PH-6A)

A962



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PERSPECTIVES (PH-6A)

A963



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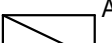
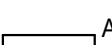
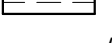
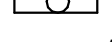
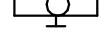
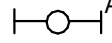
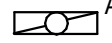
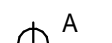
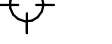
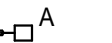
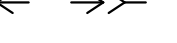
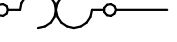
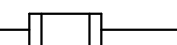
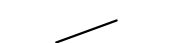
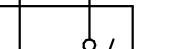
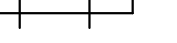
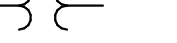
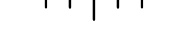
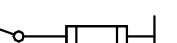
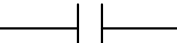
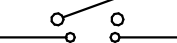
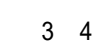
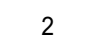
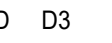
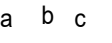
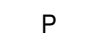
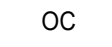
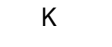
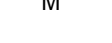
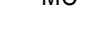
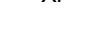
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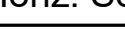
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| REV. #            | DESCRIPTION | DATE |

PERSPECTIVES (PH-6A)

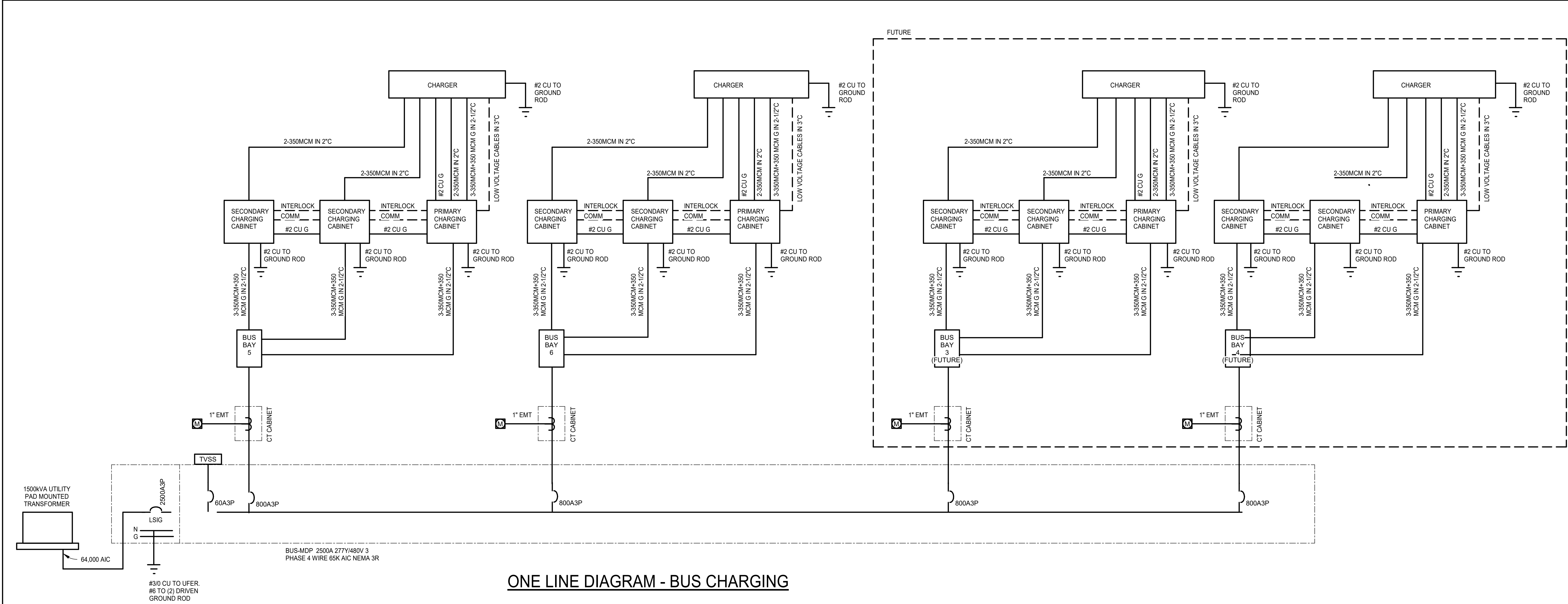
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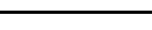
| ABBREVIATIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| (E) EXISTING<br>(N) NEW<br>(D) DEMOLISH<br>(R) RELOCATE<br>A AMPERES<br>AC MOUNTED WITH BOTTOM OF DEVICE<br>2" ABOVE COUNTER OR 1" ABOVE COUNTER BACKSPLASH<br>AFF ABOVE FINISHED FLOOR<br>AFG ABOVE FINISHED GRADE<br>AHU AIR HANDLING UNIT<br>ATS AUTOMATIC TRANSFER SWITCH<br>BAS BUILDING AUTOMATION SYSTEM<br>BFG BELOW FINISHED GRADE<br>C CONDUIT<br>CATV CABLE TELEVISION<br>CB CIRCUIT BREAKER<br>CCTV CLOSED CIRCUIT TELEVISION<br>CU COPPER<br>DM DIGITAL METER<br>EM EMERGENCY<br>EP EXPLOSION PROOF<br>EPO EMERGENCY POWER OFF<br>EWC ELECTRIC WATER COOLER<br>FA FIRE ALARM<br>FLA FULL LOAD AMPS<br>G GROUND<br>GFI GROUND FAULT INTERRUPTER<br>HP HORSEPOWER<br>KW KILOWATT<br>LRA LOCKED ROTOR AMPS<br>MCB MAIN CIRCUIT BREAKER<br>MDC MAIN DISTRIBUTION CENTER<br>MH MOUNTING HEIGHT<br>MLO MAIN LUG ONLY<br>MTS MANUAL TRANSFER SWITCH<br>NC NORMALLY CLOSED<br>NIC NOT IN CONTRACT<br>NO NORMALLY OPEN<br>NL NIGHT LIGHT<br>NTS NOT TO SCALE<br>OFCI OWNER FURNISHED CONTRACTOR INSTALLED<br>OFOI OWNER FURNISHED OWNER INSTALLED<br>PB PULL BOX<br>TP TAMPER RESISTANT<br>TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION<br>TYP TYPICAL<br>UF UNDER FLOOR<br>UG UNDER GROUND<br>UON UNLESS OTHERWISE NOTED<br>VFD VARIABLE FREQUENCY DRIVE<br>WP WEATHERPROOF<br>XFMR TRANSFORMER |  DUPLEX RECEPTACLE<br>AC DENOTES ABOVE COUNTER<br> DUPLEX RECEPTACLE, EMERGENCY<br> DUPLEX RECEPTACLE SWITCHED<br> QUADRUPLUX RECEPTACLE<br> CLG<br>CEILING MOUNTED RECETPACLE<br> SIMPLEX RECEPTACLE<br> SPECIAL PURPOSE RECEPTACLE<br> P<br>POWER POLE<br> FLOOR RECEPTACLE<br> DISCONNECT SWITCH (NON FUSED)<br> M<br>MOTOR<br> FUSED DISCONNECT (30A/3P U.O.N.)<br> R<br>RELAY<br> T<br>THERMOSTAT<br> ATS<br>AUTOMATIC TRANSFER SWITCH<br> J<br>JUNCTION BOX<br> BUS PLUG |  A<br>RECESSED LENSED GRID TROFFER<br> A<br>RECESSED ARCHITECTURAL GRID TROFFER<br> A<br>SUSPENDED PENDANT LUMINAIRE<br> A<br>SURFACE MOUNTED TROFFER<br> A<br>SURFACE MOUNTED TROFFER<br> A<br>SURFACE MOUNTED STRIP<br> A<br>FLANGED TROFFER<br> A<br>RECESSED DOWNLIGHT<br> A<br>RECESSED WALL WASHER<br> A<br>WALL MTD.<br> A<br>SURFACE MOUNT LUMINAIRE<br> A<br>PENDANT MOUNTED LUMINAIRE<br> A<br>RECESSED WALL MOUNTED LIGHT<br> A<br>LIGHT TRACK W/NUM. OF HEADS IND.<br> A<br>UNDER CABINET LIGHT<br> A<br>POLE MOUNTED LUMINAIRE<br> A<br>LIGHTED BOLLARD<br> A<br>SPOT OR FLOOD LIGHT<br> X<br>EXIT SIGN - ARROWS AS INDICATED ON DRAWINGS; FACES AS INDICATED BY SHADING<br>LETTER REFERS TO FIXTURE TYPE - SEE LIGHTING FIXTURE SCHEDULE<br>SHADING INDICATES FIXTURE FED FROM EMERGENCY INVERTER SYSTEM |  L SIG<br>CIRCUIT BREAKER (L=ADJUSTABLE LONG TIME PICKUP; S=ADJUSTABLE SHORT TIME PICK UP; I=ADJUSTABLE INSTANEOUS TRIP; G=ADJUSTABLE GROUND FAULT TRIP.<br> LOW VOLTAGE DRAWOUT CIRCUIT BREAKER<br> OVERLOADS<br> FUSE<br> LOAD BREAK SWITCH<br> FUSE LOAD BREAK SWITCH<br> SAFETY SWITCH W/AUX. CONTACT (30/3 U.O.N.)<br> CURRENT TRANSFORMER<br> CONTROL POWER TRANSFORMER (CPT) POTENTIAL TRANSFORMER (PTs)<br> POWER TRANSFORMER<br> ISOLATION POWER TRANSFORMER<br> COMBINATION CONTACTOR WITH THERMAL MAGNETIC CIRCUIT BREAKER<br> COMBINATION CONTACTOR WITH FUSED SWITCH<br> CONTACTOR<br> LIGHTNING ARRESTOR<br> EL<br>ELECTRIC INTERLOCK<br> BD<br>BUS DUCT<br> PANELBOARD<br> N • E • L •<br>AUTOMATIC TRANSFER SWITCH<br> A<br>AMMMETER<br> AS<br>AMMETER SELECTOR<br> R<br>RELAY<br> V<br>VOLT METER<br> VS<br>VOLT METER SELECTOR<br> WM<br>WATT METER<br> M<br>UTILITY METER | 1. WORK INCLUDED IN THE CONTRACT IS DENOTED IN BOLD. EXISTING CONDITIONS TO REMAIN ARE DENOTED LIGHTLY.<br>2. ALL ELECTRICAL WORK PERFORMED UNDER THIS CONTRACT SHALL CONFORM WITH THE 2021 INTERNATIONAL BUILDING CODES, 2021 INTERNATIONAL ENERGY CONSERVATION CODE, 2021 INTERNATIONAL FIRE CODE AND, LOCAL BUILDING AND FIRE DEPARTMENT REQUIREMENTS AND THE 2023 NATIONAL ELECTRICAL CODE (NEC).<br>3. ELECTRICAL CONTRACTOR SHALL FULLY COORDINATE WITH OWNER REPRESENTATIVES. PERFORM WORK IN ACCORDANCE WITH REQUIREMENTS OF OWNER REPRESENTATIVES. ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER OF ANY CHANGES REQUIRED BY THE BUILDING MANAGEMENT AND TENANT REPRESENTATIVES.<br>4. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF ELECTRICAL WORK. LOCATIONS ARE APPROXIMATE AND SHALL BE SUBJECT TO MINOR MODIFICATIONS AS DIRECTED BY THE GENERAL CONTRACTOR AND OWNER REPRESENTATIVES. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXACT FITTING OF ALL MATERIALS, EQUIPMENT, ETC., IN THE BUILDING AND TENANT SPACE. ALL DIMENSIONS SHALL BE VERIFIED ON THE JOB. ELECTRICAL CONTRACTOR SHALL CUT, CHANNEL, CHASE, AND/OR DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, OR OTHER SURFACES AS REQUIRED FOR INSTALLATION. UPPORT, ANCHORAGE, ETC., OF WORK, PROVIDE X-RAY OF FLOOR PRIOR TO CORE DRILLS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSEQUENT PATCHING WORK.<br>5. A DETAILED WRITTEN METHOD OF PROCEDURE IS REQUIRED WHEN A CONSTRUCTION ACTIVITY OR AN OUTAGE AFFECTS THE SAFETY OF OCCUPANTS, TELEPHONE/DATA/FIRE ALARM EQUIPMENT OR COMPONENTS OF ANY SYSTEM WHICH SUPPORTS THIS EQUIPMENT OR ESSENTIALLY AFFECTS THE BUILDING MANAGEMENT, OPERATIONS OR SECURITY. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.<br>6. PRIOR TO SUBMITTING BIDS, THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE TO VERIFY EXISTING ELECTRICAL EQUIPMENT CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF THE WORK. FIELD VERIFY QUANTITIES OF EXISTING LIGHT FIXTURES, ELECTRICAL DEVICES, COMMUNICATION DEVICES, FIRE ALARM DEVICES, AND ELECTRICAL EQUIPMENT. NOTIFY THE ARCHITECT AND ENGINEER OF ANY EXISTING CONDITIONS, WHICH MODIFY THE SCOPE OF WORK AS SHOWN ON THE CONSTRUCTION DOCUMENTS. SUBMISSION OF A BID PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR MOBILIZATION, LABOR, EQUIPMENT, AND/OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.<br>7. PROTECT STRUCTURE AND OWNER EQUIPMENT FROM DAMAGE. IMMEDIATELY REPLACE OR REPAIR, TO ORIGINAL CONDITION, DAMAGE CAUSED BY THE CONTRACTOR WHETHER EQUIPMENT APPEARS TO BE CURRENTLY IN USE OR NOT, UNLESS WRITTEN AUTHORIZATION FROM THE OWNER INDICATED OTHERWISE. PREPARE LISTING OF ALL EXISTING DAMAGED ITEMS AND SUBMIT TO OWNER PRIOR TO BEGINNING WORK.<br>8. EXISTING INFORMATION SHOWN ON THE DRAWINGS HAS BEEN TAKEN FROM OWNER FURNISHED DRAWINGS AND/OR LIMITED FIELD OBSERVATIONS. CMO CONSULTING ENGINEERS, LLC IS NOT RESPONSIBLE FOR THE ACCURACY OF ANY INFORMATION OR THE ADEQUACY, SAFETY AND CONFORMANCE TO CURRENT PREVAILING CODES OF ANY WORK SHOWN AS EXISTING ON THESE DRAWINGS.<br>9. FIELD LOCATE EXISTING UNDERGROUND PUBLIC AND OWNER UTILITIES OF ALL TRADES AND BUILDING GROUNDING/LIGHTNING PROTECTION SYSTEMS PRIOR TO ANY EXCAVATION. REPLACE OR REPAIR DAMAGED UTILITIES AND GROUNDING/LIGHTNING PROTECTION SYSTEMS TO ORIGINAL CONDITION.<br>10. INSTALL CONDUIT CONCEALED IN FINISHED AREAS UNLESS OTHERWISE NOTED.<br>11. DO NOT ROUTE CONDUIT WITHIN STRUCTURAL OR TOPPING SLABS OF FLOORS UNLESS SPECIFICALLY NOTED OTHERWISE AND WRITTEN APPROVAL IS OBTAINED FROM THE STRUCTURAL ENGINEER.<br>12. FIRE SEAL ALL FIRE RATED WALL AND FLOOR PENETRATIONS. VERIFY RATED WALL LOCATIONS ON ARCHITECTURAL DRAWINGS.<br>13. PROVIDE SEPARATE INSULATED GROUNDING CONDUCTOR IN ALL FEEDER, HOMERUN AND BRANCH CIRCUITS.<br>14. REFER TO ARCHITECTURAL AND MECHANICAL EQUIPMENT DRAWINGS FOR EXACT LOCATIONS OF ELECTRICAL DEVICES AND LIGHT FIXTURES. DO NOT SCALE FROM THE ELECTRICAL PLANS. ADDITIONAL ELECTRICAL REQUIREMENTS ON ARCHITECTURAL PLANS, KITCHEN EQUIPMENT PLANS, AND MECHANICAL PLANS SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.<br>15. DEMOLITION OF ANY ELECTRICAL, LOW VOLTAGE, AND COMMUNICATIONS CONDUIT, WIRING, CABLING, OR DEVICE MEANS TO REMOVE IN ITS ENTIRETY. REMOVE UNUSED CONDUITS FROM CEILING SPACES IN AREAS OF WORK. RETURN UNUSED ELECTRICAL EQUIPMENT AND LIGHT FIXTURES TO BUILDING MANAGEMENT FOR STORAGE AND/OR REMOVAL FROM SITE AS DIRECTED BY OWNERS.<br>16. WHERE REMODELING INTERFERES WITH EXISTING CIRCUITS AND EQUIPMENT WHICH ARE NOT TO BE REMOVED OR ARE OUTSIDE OF THE PROJECT AREA, SUCH CIRCUITS AND EQUIPMENT SHALL BE REWORKED AND RELOCATED AS REQUIRED TO COMPLETE THE PROJECT.<br>17. MINIMUM WORKING CLEARANCES PER THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE SHALL BE PROVIDED AROUND AND IN FRONT OF ALL ELECTRICAL EQUIPMENT.<br>18. ELECTRICAL CONTRACTOR SHALL MAINTAIN ON THE JOB AN UP TO DATE SET OF WORKING DRAWINGS, MARKED UP TO SHOW ELECTRICAL SYSTEMS AS INSTALLED. PROVIDE TENANT REPRESENTATIVES WITH ONE SET OF REPRODUCIBLES WITH "AS BUILT" PROJECT RECORD INFORMATION CLEARLY INDICATED. ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LOCAL FEES, PERMITS, AND SERVICES OF INSPECTION AUTHORITIES REQUIRED BY ELECTRICAL WORK FOR THIS ELECTRICAL CONSTRUCTION<br>19. PROVIDE TYPED, UPDATED, COMPLETE AND ACCURATE PANELBOARD CIRCUIT DIRECTORIES AT THE COMPLETION OF WORK. CLEAN EXPOSED PANELBOARD SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AS REQUIRED AND PROVIDE FILLER PLATES FOR VACANT SPACES.<br>20. PROVIDE UPDATED LABELING OF ALL NEW AND RELOCATED ELECTRICAL EQUIPMENT IN SCOPE OF WORK INCLUDING, BUT NOT LIMITED TO, ENGINE GENERATOR SYSTEMS, TRANSFER SWITCHES, TRANSFORMERS, SWITCHGEAR, SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, AND DISCONNECTS TO INDICATE THE AMPERE RATING, VOLTAGE RATING, PHASE, CONDUCTOR COLOR CODING WITHIN THE EQUIPMENT AND APPLICABLE AIC RATING.<br>21. ALL NEW AND MODIFIED ELECTRICAL EQUIPMENT, SUCH AS SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOCKET ENCLOSURES, AND MOTOR CONTROL CENTERS, THAT ARE LIKELY TO REQUIRE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE WHILE ENERGIZED SHALL BE FIELD MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS. THE MARKING SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO QUALIFIED PERSONS BEFORE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE OF THE EQUIPMENT PER NEC ARTICLE 110.16. |  |              |  |               |  |
| PANELS: CONDUIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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        |  |              |  |               |  |
|  PANEL, POWER<br> PANEL, DISTRIBUTION<br> CONDUIT, CONCEALED BELOW<br> CONDUIT, CONCEALED ABOVE OR IN WALL<br> CONDUIT EXPOSED<br> CONDUIT UP<br> CONDUIT DOWN<br> HOMERUN (DESIGNATION INDICATED PANELBOARD-CIRCUIT #)                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                            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PC<br>PHOTOCELL                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| Print Date: 9/17/2024 12:43:09 AM                                                                                                                                                                                                                                                                         |             | Sheet Revisions |             |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER (PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 | FIR Plans     |               | ELECTRICAL LEGEND |                        |                         |  | Project No./Code |  |
| File Name: CDOT.dwg                                                                                                                                                                                                                                                                                       |             | Rev.            | Date        | Comments                   | Init. |                                                                                                                                                     | No Revisions: |               |                   |                        |                         |  | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                         |             | <div></div>     | 09/17/2024  | 50% CONSTRUCTION DOCUMENTS | CB    |                                                                                                                                                     | Revised:      |               | Designer:         | Structure Numbers      | 25924                   |  |                  |  |
| <div> Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div> | <div></div> |                 |             |                            |       |                                                                                                                                                     | Void:         |               | Detailer:         |                        | Sheet Number      CE101 |  |                  |  |
|                                                                                                                                                                                                                                                                                                           |             |                 | <div></div> |                            |       |                                                                                                                                                     |               | Sheet Subset: |                   | Subset Sheets:      of |                         |  |                  |  |

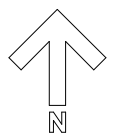
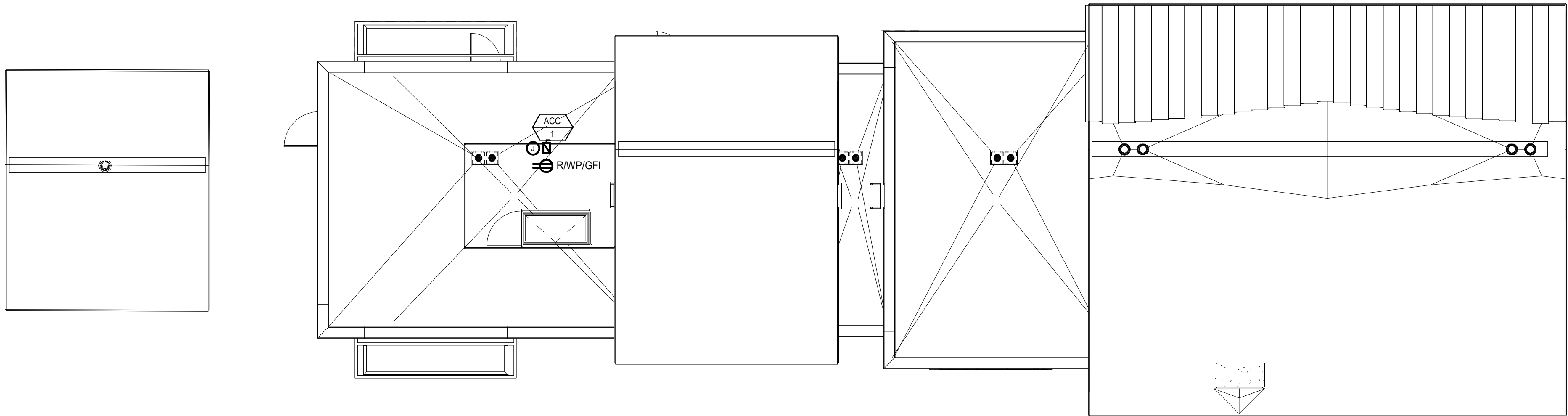




ONE LINE DIAGRAM - BUS CHARGING

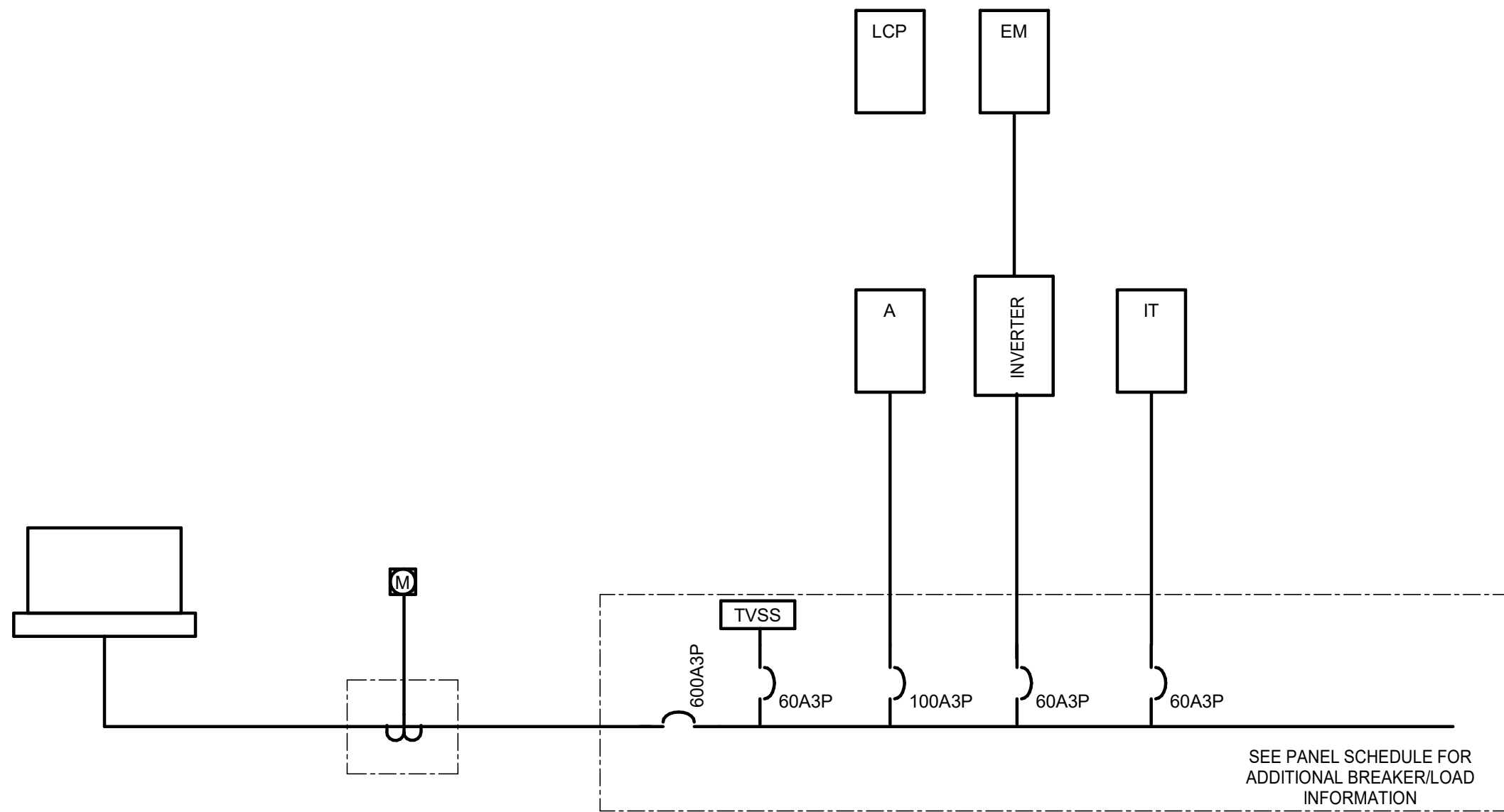
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| Print Date: 9/17/2024 12:43:09 AM                                                                                                                                                                                                                                                                                          |  | Sheet Revisions |            |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b><br><b>(PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 | FIR Plans     |               | ONE LINE DIAGRAM - BUS CHARGING |                   |                    | Project No./Code |  |
| File Name: CDOT.dwg                                                                                                                                                                                                                                                                                                        |  | Rev.            | Date       | Comments                   | Init. |                                                                                                                                                               | No Revisions: |               |                                 |                   |                    | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                                          |  | <div></div>     | 09/17/2024 | 50% CONSTRUCTION DOCUMENTS | CB    |                                                                                                                                                               | Revised:      |               | Designer:                       | Structure Numbers | 25924              |                  |  |
| <div><div> Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>     |            |                            |       |                                                                                                                                                               | Void:         |               | Detailer:                       |                   | Sheet Number CE201 |                  |  |
|                                                                                                                                                                                                                                                                                                                            |  | <div></div>     |            |                            |       |                                                                                                                                                               |               | Sheet Subset: | Subset Sheets:                  | of                |                    |                  |  |





### (PH 6A) ROOF

SCALE: 1/8" = 1'-0"



### ONE LINE DIAGRAM - TRANSIT CENTER

| Mechanical Equipment Schedule |     |                               |    |      |          |              |          |         |        |         |            |            |      |                |
|-------------------------------|-----|-------------------------------|----|------|----------|--------------|----------|---------|--------|---------|------------|------------|------|----------------|
| Key                           | #   | Item                          | HP | FLA  | Load     | Eq Load (VA) | Voltage  | Feeders |        |         | Protection |            |      | Notes          |
|                               |     |                               |    |      |          |              |          | Wire    | Ground | Conduit | Breaker    | Disconnect | Fuse |                |
| ACC                           | 1   | AIR CONDITIONING SPLIT SYSTEM | 0  | 2 A  | 0 VA     | 416 VA       | 208V 1ph | 2#12    | #12G   | 3/4"    | 20 A       | S          |      | FED FROM FCU-1 |
| B                             | 1   | BOILER                        | 0  | 10 A | 0 VA     | 3603 VA      | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 15 A |                |
| B                             | 2   | BOILER                        | 0  | 10 A | 0 VA     | 3603 VA      | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 15 A |                |
| ERV                           | 1   | ENERGY RECOVERY VENTILLATION  | 0  | 2 A  | 0 VA     | 416 VA       | 208V 1ph | 2#12    | #12G   | 3/4"    | 20 A       | S          |      | MCA 2; MOP 15  |
| ERV                           | 2   | ENERGY RECOVERY VENTILLATION  | 0  | 2 A  | 0 VA     | 416 VA       | 208V 1ph | 2#12    | #12G   | 3/4"    | 20 A       | S          |      | MCA 2; MOP 15  |
| EUH                           | 1   | ELECTRIC UNIT HEATER          | 0  | 0 A  | 5000 VA  | 5000 VA      | 208V 1ph | 2#8     | #10G   | 3/4"    | 35 A       | 60 A       |      |                |
| EUH                           | 2   | ELECTRIC UNIT HEATER          | 0  | 0 A  | 5000 VA  | 5000 VA      | 208V 1ph | 2#8     | #10G   | 3/4"    | 35 A       | 60 A       |      |                |
| FCU                           | 1   | FAN COIL UNIT                 | 0  | 11 A | 0 VA     | 2288 VA      | 208V 1ph | 2#12    | #12G   | 3/4"    | 20 A       | S          |      |                |
| H                             | 101 | ELECTRIC HEATER               | 0  | 0 A  | 500 VA   | 500 VA       | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 3 A  |                |
| H                             | 101 | ELECTRIC HEATER               | 0  | 0 A  | 500 VA   | 500 VA       | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 3 A  |                |
| H                             | 101 | ELECTRIC HEATER               | 0  | 0 A  | 500 VA   | 500 VA       | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 3 A  |                |
| H                             | 102 | ELECTRIC HEATER               | 0  | 0 A  | 2000 VA  | 2000 VA      | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 10 A |                |
| H                             | 102 | ELECTRIC HEATER               | 0  | 0 A  | 2000 VA  | 2000 VA      | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 10 A |                |
| VAV                           | 101 | VARIABLE AIR UNIT HEAT        | 0  | 0 A  | 16000 VA | 16000 VA     | 208V 3ph | 3#4     | #10G   | 1-1/4"  | 60 A       | 60 A       | 60 A |                |
| VAV                           | 102 | VARIABLE AIR UNIT HEAT        | 0  | 0 A  | 9500 VA  | 9500 VA      | 208V 3ph | 3#8     | #10G   | 3/4"    | 35 A       | 60 A       | 35 A |                |
| VAV                           | 103 | VARIABLE AIR UNIT HEAT        | 0  | 0 A  | 5000 VA  | 5000 VA      | 208V 3ph | 3#12    | #12G   | 3/4"    | 20 A       | 30 A       | 20 A |                |
| VAV                           | 104 | VARIABLE AIR UNIT HEAT        | 0  | 0 A  | 16000 VA | 16000 VA     | 208V 3ph | 3#4     | #10G   | 1-1/4"  | 60 A       | 60 A       | 60 A |                |
| VAV                           | 105 | VARIABLE AIR UNIT HEAT        | 0  | 0 A  | 3000 VA  | 3000 VA      | 208V 3ph | 3#12    | #12G   | 3/4"    | 15 A       | 30 A       | 15 A |                |
| WSHP                          | 1   | WATER SOURCE HEAT PUMP        | 0  | 35 A | 0 VA     | 12609 VA     | 208V 3ph | 3#6     | #10G   | 1"      | 45 A       | 60 A       | 45 A | MCA 37; MOP 50 |

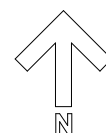
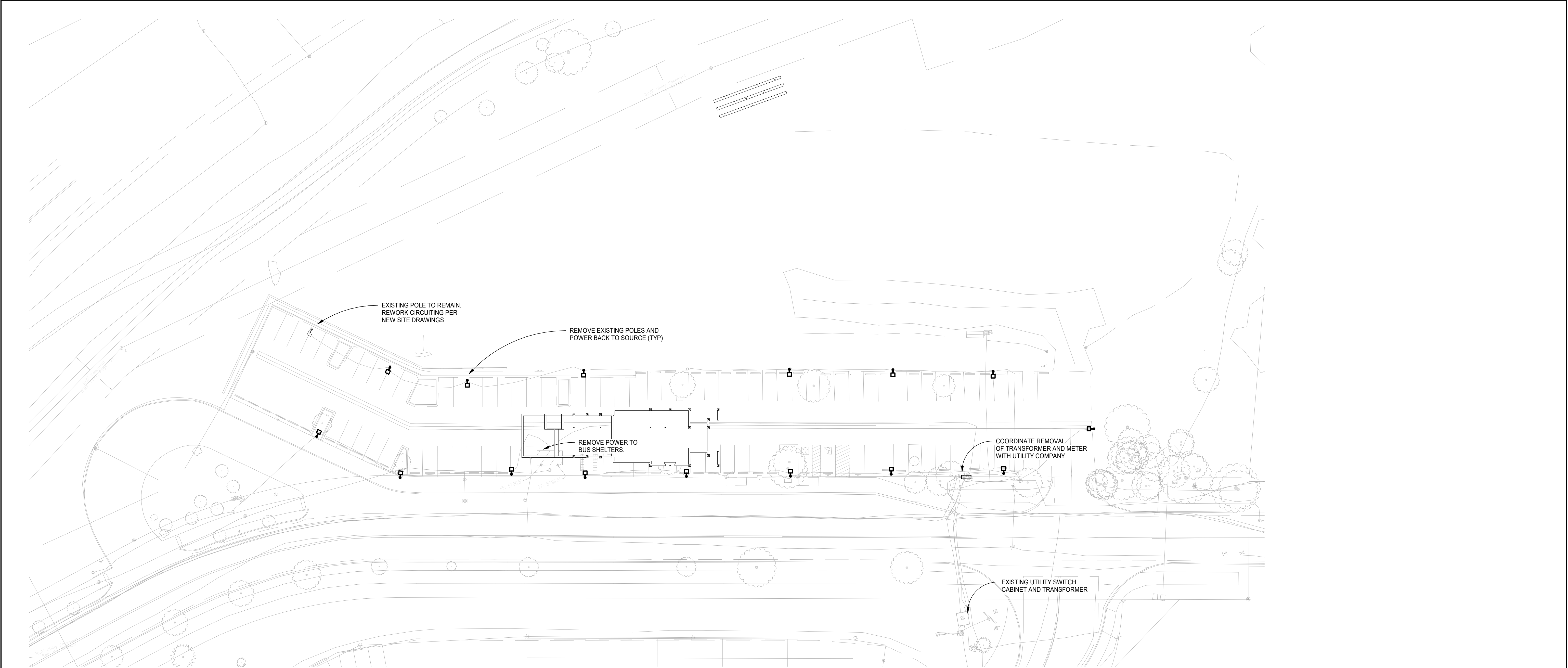
| Luminaire Schedule |                                                                                                                                              |                |               |                    |                                                      |         |               |              |         |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|--------------------|------------------------------------------------------|---------|---------------|--------------|---------|
| Type               | Description                                                                                                                                  | Lamp           | Apparent Load | Manufacturer       | Catalog #                                            | Voltage | Finish        | Mounting     | Depth   |
| A2                 | 2'x2' RECESSED ARCHITECTURAL LED TROFFER                                                                                                     | LED            | 32 VA         | LITHONIA           | 2 BLT2 40L ADPT 120 LP835                            | 120.0 V |               | RECESS       | 0' - 6" |
| D4                 | 4" RECESSED DOWNLIGHT                                                                                                                        | LED 1100 LUMEN | 13 VA         | FOCAL POINT        | FLC3D RO 1100L 120 BL                                | 120.0 V | CLEAR DIFFUSE | RECESSED     |         |
| D6                 | 6" RECESSED DOWNLIGHT                                                                                                                        | LED            | 15 VA         | PRESCOLITE         | LFR-6RD-M 20L 30K 80CRI WD LFR-6RD-T MD SS WT        | 120.0 V | WHITE         | RECESSED     |         |
| ED4                | 4" RECESSED DOWNLIGHT - 2000 LM. SUITABLE FOR LOW TEMPERATURES AND WET LOCATION LABELED.                                                     | LED            | 22 VA         | FOCALPOINT         | FLCS3 RO 1100 120V L11 LITE LC3 RO 1100 30K DNT FLCD | 120.0 V |               | RECESSED     |         |
| EP1                | DECORATIVE POLE LIGHT. TYPE 3 DISTRIBUTION. FULL CUTOFF. SUITABLE FOR LOW TEMPERATURES AND WET LOCATION LABELED.                             | LED            | 71 VA         | AAL                | UMC2 ANG-36L-615-5K7-3                               | 208.0 V |               | POLE         | 0' - 0" |
| EP2                | EXTERIOR AREA LIGHT. TWIN POLE LIGHT WITH 2' BASE. TYPE 3 DISTRIBUTION. FULL CUTOFF. SUITABLE FOR LOW TEMPERATURES AND WET LOCATION LABELED. | LED            | 143 VA        | AAL                | UCM2-ANG-36L-615-5 K7-3-CL                           | 208.0 V |               | POLE         | 0' - 0" |
| EP3                | DECORATIVE POLE LIGHT. TYPE 5 DISTRIBUTION. FULL CUTOFF. SUITABLE FOR LOW TEMPERATURES AND WET LOCATION LABELED.                             | LED            | 71 VA         | AAL                | PROV2-36L-510-5K7-5 Q-CL                             | 208.0 V |               | POLE         | 0' - 0" |
| EW1                | EXTERIOR LED WALL LIGHT. SUITABLE FOR LOW TEMPERATURES AND WET LOCATION LABELED.                                                             | LED            | 40 VA         | LITHONIA           | DSX2-LED                                             | 120.0 V |               | SURFACE WALL |         |
| L4                 | 4' LED LENSED STRIP                                                                                                                          | LED            | 48 VA         | LITHONIA           | LPT-ML                                               | 120.0 V |               | SURFACE      |         |
| LL3                | 4' LINEAR. DIMMING. SATINE LENS                                                                                                              | LED            | 14 VA         | FINELITE           | EV4D A 35 3 XX U XX 1 BL                             | 120.0 V |               | RECESS       | 0' - 0" |
| LL3A               | 4' LINEAR. DIMMING. SATINE LENS                                                                                                              | LED            | 14 VA         | FINELITE           | EV4D A 35 3 XX U XX 1 BL                             | 120.0 V |               | RECESS       | 0' - 0" |
| LL8                | 8' PENDANT LINEAR PENDANT WITH UP. DIMMING WITH DAYLIGHT AND OCCUPANCY SENSORS. ADJUSTABLE CABLE                                             | LED            | 56 VA         | MARK LIGHTING      | S4LW1 8 2 H 35K AS EOHN120 WHT                       | 120.0 V |               | PENDANT      | 0' - 0" |
| UC                 | 2' UNDERCABINET FIXTURE                                                                                                                      | LED            | 18 VA         | LITHONIA           | RAZ 24 35K                                           | 120.0 V |               | SURFACE      |         |
| W1                 | 50 INCH WALL VANITY LIGHT                                                                                                                    | LED            | 32 VA         | VISA               | CB5504                                               | 120.0 V |               | SURFACE WALL |         |
| W2                 | 24" VANITY SCONCE                                                                                                                            | LED            | 17 VA         | OXYGEN             | 3-537-XX                                             | 120.0 V |               | SURFACE WALL |         |
| X1                 | LED EDGELIT EXIT SIGNAGE WITH SINGLE FACE, BATTERY BACK WITH SELF DISGNOSTICS, GREEN LETTERS ON WHITE                                        | LED            | 3 VA          | LITHONIA, DUALLITE | LRP                                                  | 120.0 V |               | UNIVERSAL    |         |

|                                                                                                                                                                                                     |                 |            |                            |       |                                                                                                                                                               |  |               |  |                  |                   |    |                  |       |
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| Print Date: 9/17/2024 12:43:12 AM                                                                                                                                                                   | Sheet Revisions |            |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b><br><b>(PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 |  | FIR Plans     |  | ONE LINE DIAGRAM |                   |    | Project No./Code |       |
| File Name: CDOT.dwg                                                                                                                                                                                 | Rev.            | Date       | Comments                   | Init. |                                                                                                                                                               |  | No Revisions: |  |                  |                   |    | TRG M535-014     |       |
| Horiz. Scale: As Noted                                                                                                                                                                              |                 | 09/17/2024 | 50% CONSTRUCTION DOCUMENTS | CB    |                                                                                                                                                               |  | Revised:      |  | Designer:        | Structure Numbers |    | 25924            |       |
| Vert. Scale: As Noted                                                                                                                                                                               |                 |            |                            |       |                                                                                                                                                               |  | Void:         |  | Detailer:        |                   |    | Sheet Number     | CE202 |
| Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                 |            |                            |       |                                                                                                                                                               |  |               |  | Sheet Subset:    | Subset Sheets:    | of |                  |       |



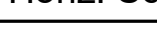




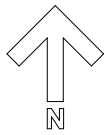
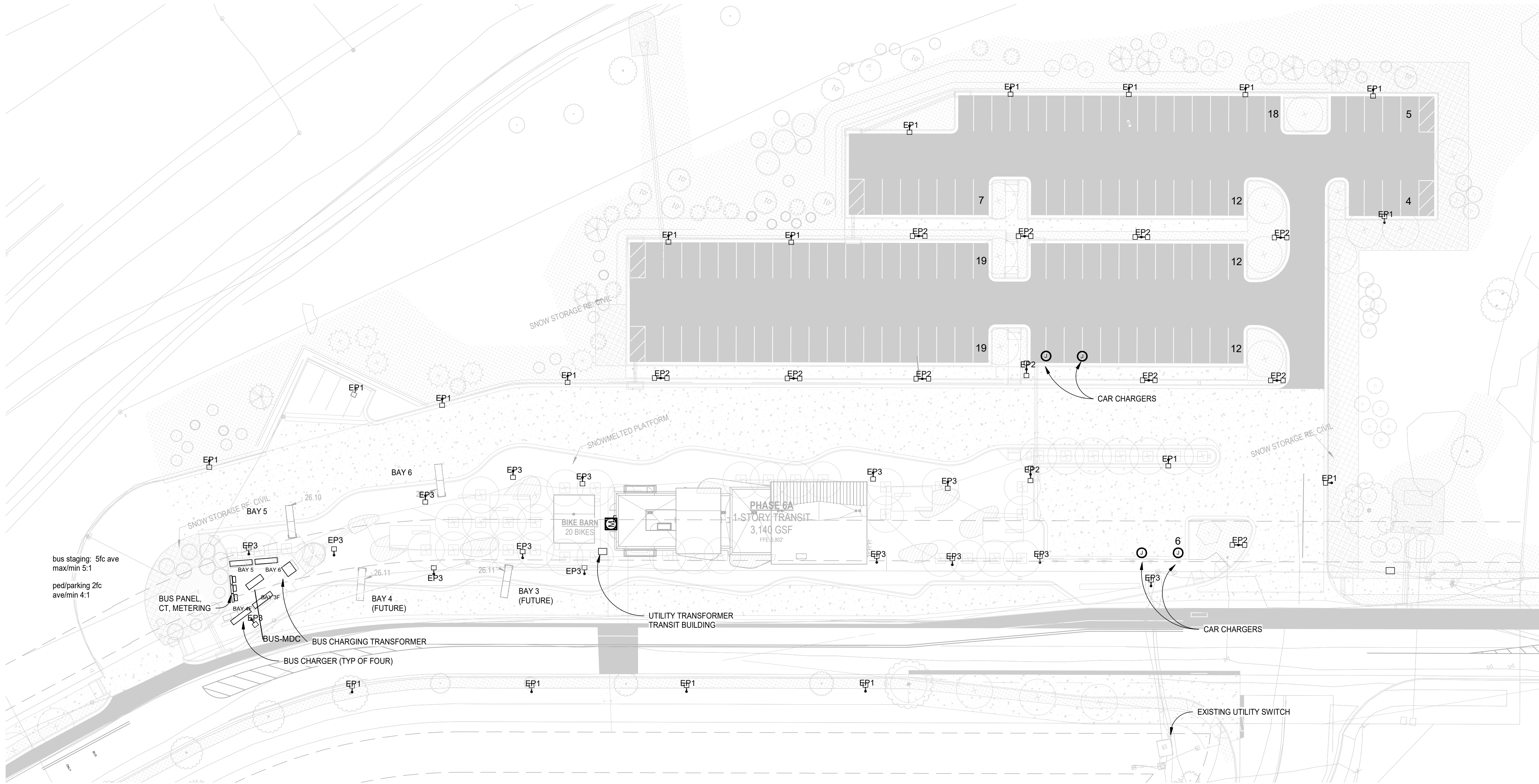


**(PH 6A) SITE DEMO**

SCALE: 1" = 30'-0"

|                                                                                                                                                                                                                                                                                                            |             |                 |            |                            |       |                                                                                                                                                               |               |  |                           |                        |                         |                  |  |
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| Print Date: 9/17/2024 12:43:14 AM                                                                                                                                                                                                                                                                          |             | Sheet Revisions |            |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b><br><b>(PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 | FIR Plans     |  | SITE ELECTRICAL DEMO PLAN |                        |                         | Project No./Code |  |
| File Name: CDOT.dwg                                                                                                                                                                                                                                                                                        |             | Rev.            | Date       | Comments                   | Init. |                                                                                                                                                               | No Revisions: |  |                           |                        |                         | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                                                                          |             | <div></div>     | 09/17/2024 | 50% CONSTRUCTION DOCUMENTS | CB    |                                                                                                                                                               | Revised:      |  | Designer:                 | Structure Numbers      | 25924                   |                  |  |
| <div> Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele: (720) 540-6800<br/>(800) 490-4966<br/>Fax: (720) 540-6801</div> | <div></div> |                 |            |                            |       |                                                                                                                                                               | Void:         |  | Detailer:                 |                        | Sheet Number      CE300 |                  |  |
|                                                                                                                                                                                                                                                                                                            | <div></div> |                 |            |                            |       |                                                                                                                                                               |               |  | Sheet Subset:             | Subset Sheets:      of |                         |                  |  |

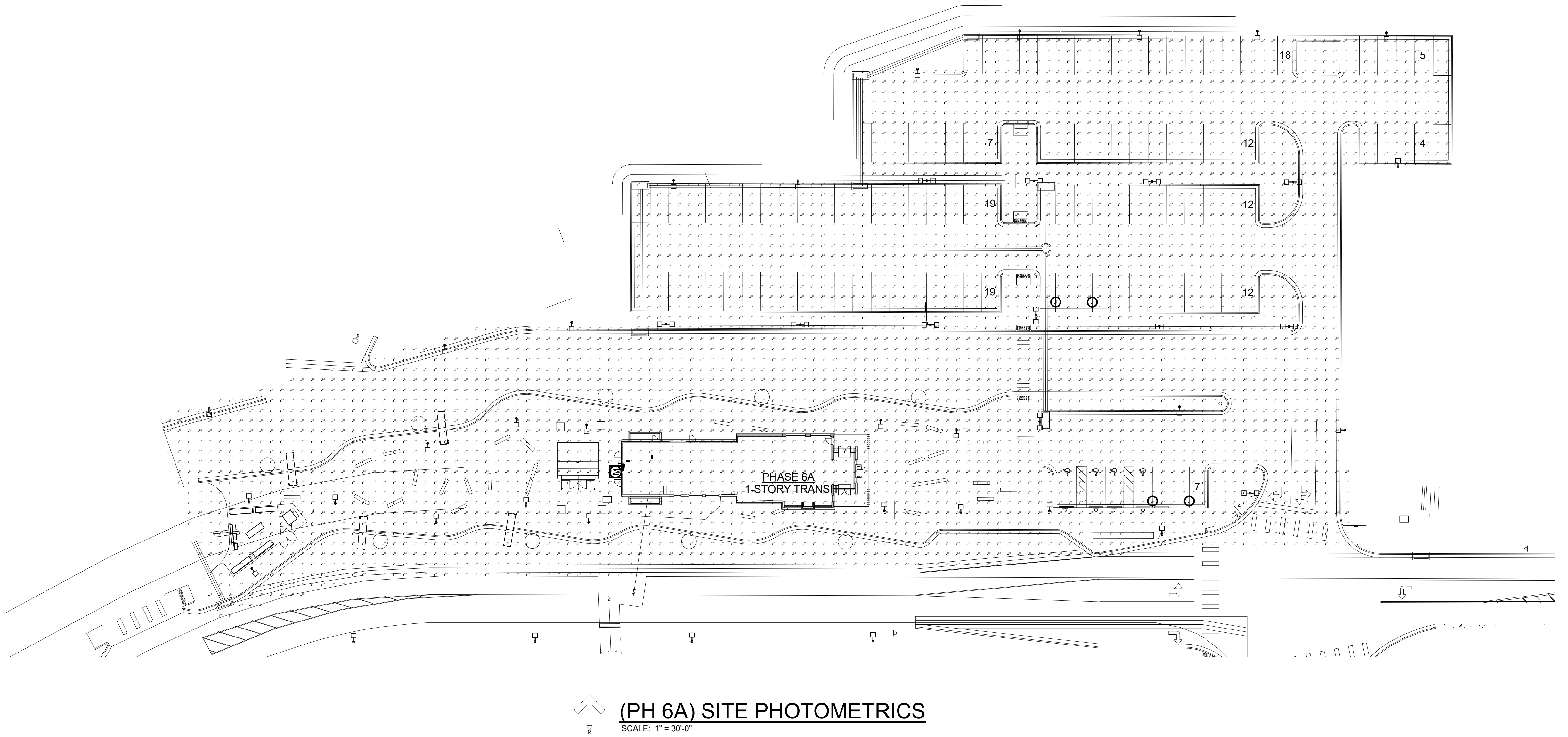




**(PH 6A) SITE**  
SCALE: 1" = 30'-0"

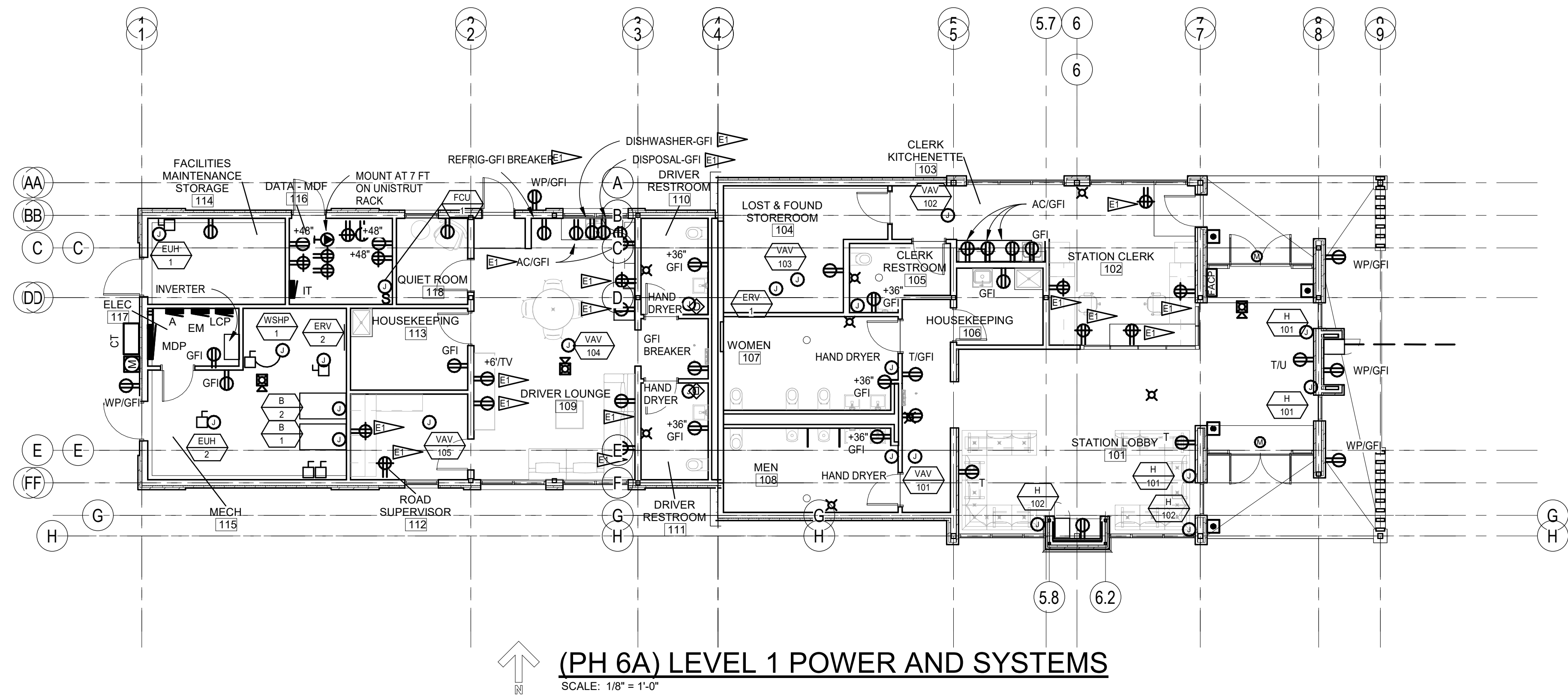
|                                                                                                                                                                                                                                                        |  |                       |      |             |            |                                                                                                                                                               |  |                            |    |                   |  |                    |                   |       |  |
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| Print Date: 9/17/2024 12:43:25 AM                                                                                                                                                                                                                      |  | Sheet Revisions       |      |             |            | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b><br><b>(PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 |  | FIR Plans                  |    | SITE PLAN         |  |                    | Project No./Code  |       |  |
| File Name: CDOT.dwg                                                                                                                                                                                                                                    |  | Rev.                  | Date | Comments    | Init.      |                                                                                                                                                               |  | No Revisions:              |    |                   |  |                    | TRG M535-014      |       |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                 |  | Vert. Scale: As Noted |      | <div></div> | 09/17/2024 |                                                                                                                                                               |  | 50% CONSTRUCTION DOCUMENTS | CB | Revised:          |  | Designer:          | Structure Numbers | 25924 |  |
| <div><div><div></div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele: (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>           |      |             |            |                                                                                                                                                               |  | Void:                      |    | Detailer:         |  | Sheet Number CE301 |                   |       |  |
|                                                                                                                                                                                                                                                        |  | <div></div>           |      |             |            |                                                                                                                                                               |  | Sheet Subset:              |    | Subset Sheets: of |  |                    |                   |       |  |





|                                                                                                                                                                                                                                                                    |  |                       |      |             |            |                                                                                                                                                               |                            |    |                   |  |                |                   |       |  |
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| Print Date: 9/17/2024 12:43:26 AM                                                                                                                                                                                                                                  |  | Sheet Revisions       |      |             |            | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b><br><b>(PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 | FIR Plans                  |    | SITE PHOTOMETRICS |  |                | Project No./Code  |       |  |
| File Name: CDOT.dwg                                                                                                                                                                                                                                                |  | Rev.                  | Date | Comments    | Init.      |                                                                                                                                                               | No Revisions:              |    |                   |  |                | TRG M535-014      |       |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                             |  | Vert. Scale: As Noted |      | <div></div> | 09/17/2024 |                                                                                                                                                               | 50% CONSTRUCTION DOCUMENTS | CB | Revised:          |  | Designer:      | Structure Numbers | 25924 |  |
| <div><div><div></div></div><div>Short Elliott Hendrickson Inc.</div><div>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900</div><div>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>           |      |             |            |                                                                                                                                                               | Void:                      |    | Detailer:         |  | Sheet Number   |                   | CE302 |  |
|                                                                                                                                                                                                                                                                    |  | <div></div>           |      |             |            |                                                                                                                                                               |                            |    | Sheet Subset:     |  | Subset Sheets: | of                |       |  |
|                                                                                                                                                                                                                                                                    |  | <div></div>           |      |             |            |                                                                                                                                                               |                            |    |                   |  |                |                   |       |  |





## FIRE ALARM NOTES:

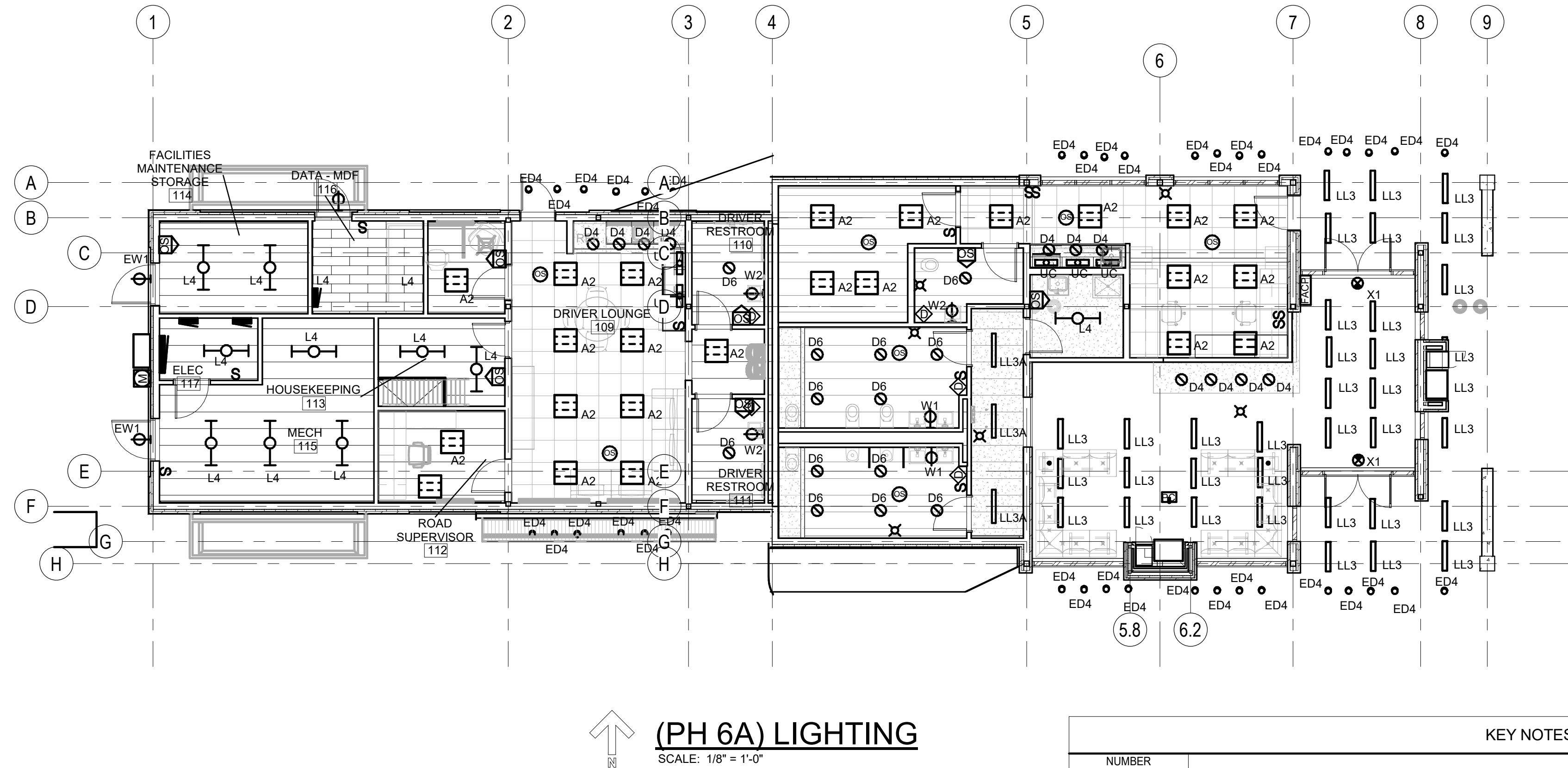
1. FIRE ALARM DEVICE LOCATIONS ON THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY INDICATE EVERY REQUIRED PIECE OF EQUIPMENT AND DEVICE. LOCATE FIRE ALARM DEVICES PER NFPA 72 AND MANUFACTURERS REQUIREMENTS. PROVIDE ALL ITEMS INCLUDING THOSE NOT SPECIFICALLY NOTED ON THE DRAWINGS, BUT WHICH ARE NECESSARY TO MAKE A COMPLETE WORKING INSTALLATION IN ACCORDANCE WITH CODE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING A SYSTEM THAT MEETS ALL NATIONAL AND LOCAL CODES. ALL FIRE ALARM SYSTEM MODIFICATIONS AND WIRING TO BE PERFORMED BY TENANT AND/OR BUILDING MANAGEMENT SHALL BE APPROVED FIRE ALARM CONTRACTOR. CONNECT DEVICES TO FIRE ALARM ZONES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE 120 VOLT CIRCUIT FOR ADDITIONAL FIRE ALARM BOOSTER PANELS IF REQUIRED FOR NEW FIRE ALARM DEVICES. PROVIDE SPOT SMOKE DETECTOR ABOVE ADDITIONAL FIRE ALARM BOOSTER PANELS. AFTER THE INSTALLATION IS COMPLETE, TENANT'S FIRE ALARM SYSTEM REPRESENTATIVE SHALL TEST THE ENTIRE FIRE ALARM SYSTEM FOR SYSTEM INTEGRITY AND OPERATION.
2. THE ELECTRICAL CONTRACTOR SHALL PROVIDE FULLY ENGINEERED FIRE ALARM SHOP DRAWINGS FOR REVIEW BY THE LOCAL BUILDING AND FIRE DEPARTMENT. THE FIRE ALARM SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER IN THE PROJECT'S STATE AND SHALL MEET ALL REQUIREMENTS OF IFC AND NFPA 72.

## POWER NOTES:

1. MAKE ALL FINAL ELECTRICAL CONNECTIONS TO EQUIPMENT REQUIRING ELECTRICAL CONNECTION. THIS SHALL INCLUDE BUT NOT BE LIMITED TO ALL MECHANICAL AND OTHER EQUIPMENT INCLUDED IN THIS PROJECT.
2. PROVIDE FUSES SIZED PER EQUIPMENT MANUFACTURER'S REQUIREMENTS.
3. DISCONNECT SWITCH LOCATIONS ARE SHOWN DIAGRAMMATICALLY AND SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS TO SUIT EQUIPMENT AND SPACE. DISCONNECT SWITCHES SHALL BE WITHIN SIGHT OF THE EQUIPMENT THEY SERVE AND MOUNTED AT 6'-3", MAXIMUM, TO TOP OF CABINET. MAINTAIN NEC WORK SPACE REQUIREMENTS.
4. RECEPTACLES INDICATED TO BE MOUNTED ABOVE COUNTER ARE TO BE MOUNTED HORIZONTALLY 6" ABOVE COUNTER WITH NEUTRAL UP.
5. COORDINATE AND VERIFY EXACT MOUNTING LOCATIONS OF WALL AND FLOOR DEVICES WITH ARCHITECTURAL ELEVATIONS, AND ANY FURNITURE OR SPECIALTY EQUIPMENT SUPPLIER DRAWINGS PRIOR TO ROUGH-IN.
6. COORDINATE EXACT REQUIREMENTS AND LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
7. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 120V SINGLE PHASE CIRCUIT.
8. ALL RECEPTACLE OUTLETS LOCATED IN TOILET ROOMS, SHOWER ROOMS, ROOFTOPS, OUTDOOR LOCATIONS, MECHANICAL ROOMS, WITHIN 6 FEET OF A SINK, OR OTHER WET LOCATIONS SHALL BE PROVIDED WITH GFCI PROTECTION PER NEC ARTICLE 210.
9. PROVIDE TAMPER RESISTIVE RECEPTACLES IN ALL HALLWAYS, CORRIDORS, WAITING AREAS, OFFICES, TOILET ROOMS AND EXAM ROOMS.
10. WHERE RECEPTACLES ARE DESIGNATED AS 'USB', PROVIDE DUPLEX RECEPTACLE WITH USB AND USB-C CONNECTIONS.

## LIGHTING NOTES:

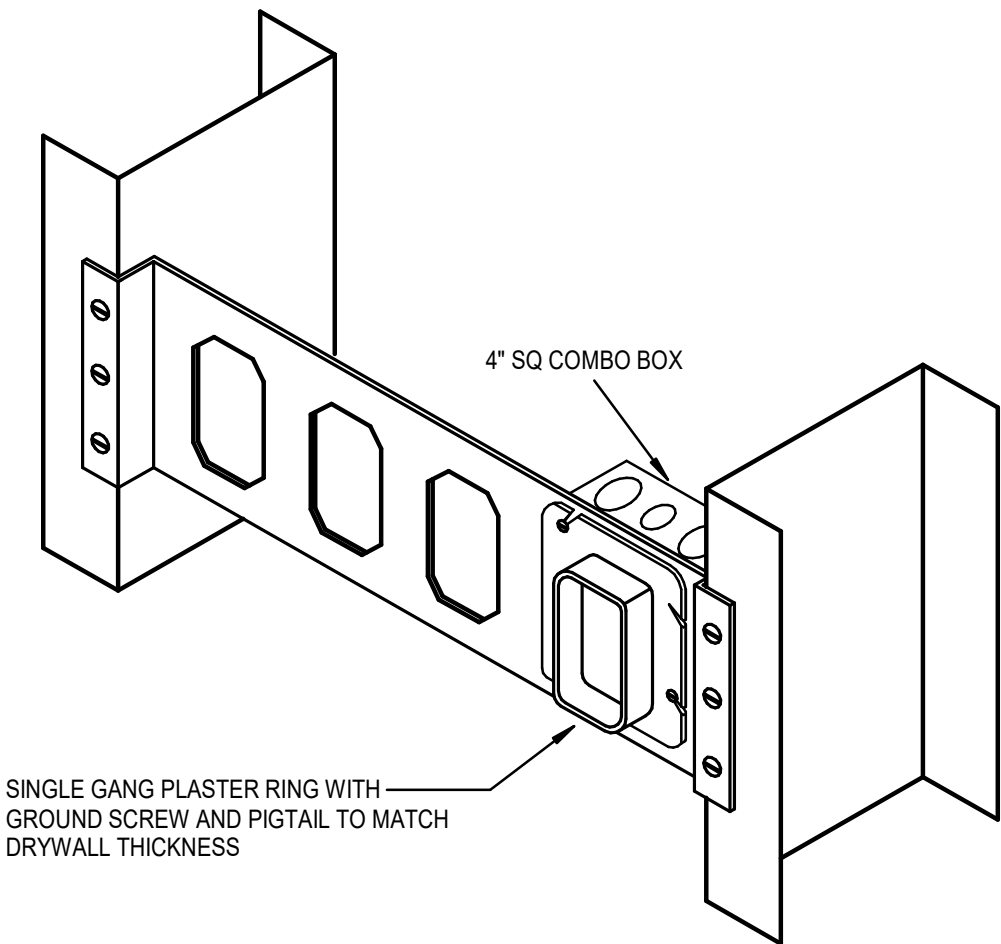
1. REFER TO ARCHITECTURAL ELEVATIONS AND REFLECTED CEILING PLANS FOR EXACT MOUNTING LOCATIONS AND MOUNTING HEIGHTS OF DEVICES AND LUMINAIRES. MOUNTING HEIGHTS ON ARCHITECTURAL PLANS TAKE PRECEDENCE OVER ELECTRICAL DRAWINGS.
2. COORDINATE LUMINAIRE LOCATIONS WITH MECHANICAL PIPING, DUCTWORK, ETC., TO AVOID CONFLICTS. SEE SPECIFICATIONS FOR COORDINATION REQUIREMENTS.
3. FIELD COORDINATE EXACT LOCATION OF CEILING MOUNTED OCCUPANCY/VACANCY SENSORS PER MANUFACTURER'S INSTRUCTIONS. THE LOCATIONS OF THE OCCUPANCY/VACANCY SENSORS ON THE DRAWINGS ARE DIAGRAMMATIC.
4. EXIT AND EGRESS LIGHTING ARE TO REMAIN UNSWITCHED.
5. COORDINATE DIMMING VACANCY SENSOR TYPE WITH LUMINAIRE.
6. AIM DIRECTIONAL LIGHTING AS DIRECTED BY OWNER.



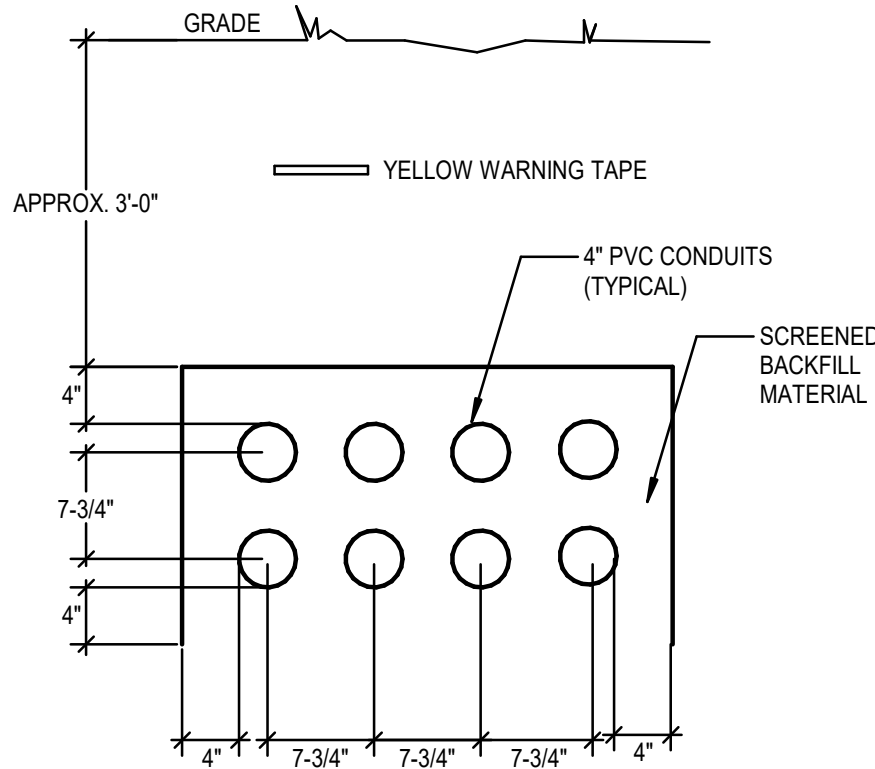
| KEY NOTES |                                                                        |
|-----------|------------------------------------------------------------------------|
| NUMBER    |                                                                        |
| E1        | RECEPTACLE OUTLET TO BE HALF CONTROLLED BY THE LIGHTING CONTROL PANEL. |

|                                                                                                                                                                                                                                                   |             |                 |            |                            |       |                                                                                                                                                               |               |               |                        |                        |                         |                  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------|------------|----------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|------------------------|------------------------|-------------------------|------------------|--|
| Print Date: 9/17/2024 12:43:32 AM                                                                                                                                                                                                                 |             | Sheet Revisions |            |                            |       | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER</b><br><b>(PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 | FIR Plans     |               | ELECTRICAL FLOOR PLANS |                        |                         | Project No./Code |  |
| File Name: CDOT.dwg                                                                                                                                                                                                                               |             | Rev.            | Date       | Comments                   | Init. |                                                                                                                                                               | No Revisions: |               |                        |                        |                         | TRG M535-014     |  |
| Horiz. Scale: As Noted      Vert. Scale: As Noted                                                                                                                                                                                                 |             | <div></div>     | 09/17/2024 | 50% CONSTRUCTION DOCUMENTS | CB    |                                                                                                                                                               | Revised:      |               | Designer:              | Structure Numbers      | 25924                   |                  |  |
| <div><div></div><div>Short Elliott Hendrickson Inc.</div><div>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele. (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> | <div></div> |                 |            |                            |       |                                                                                                                                                               | Void:         |               | Detailer:              |                        | Sheet Number      CE401 |                  |  |
|                                                                                                                                                                                                                                                   |             |                 |            |                            |       |                                                                                                                                                               |               | Sheet Subset: |                        | Subset Sheets:      of |                         |                  |  |

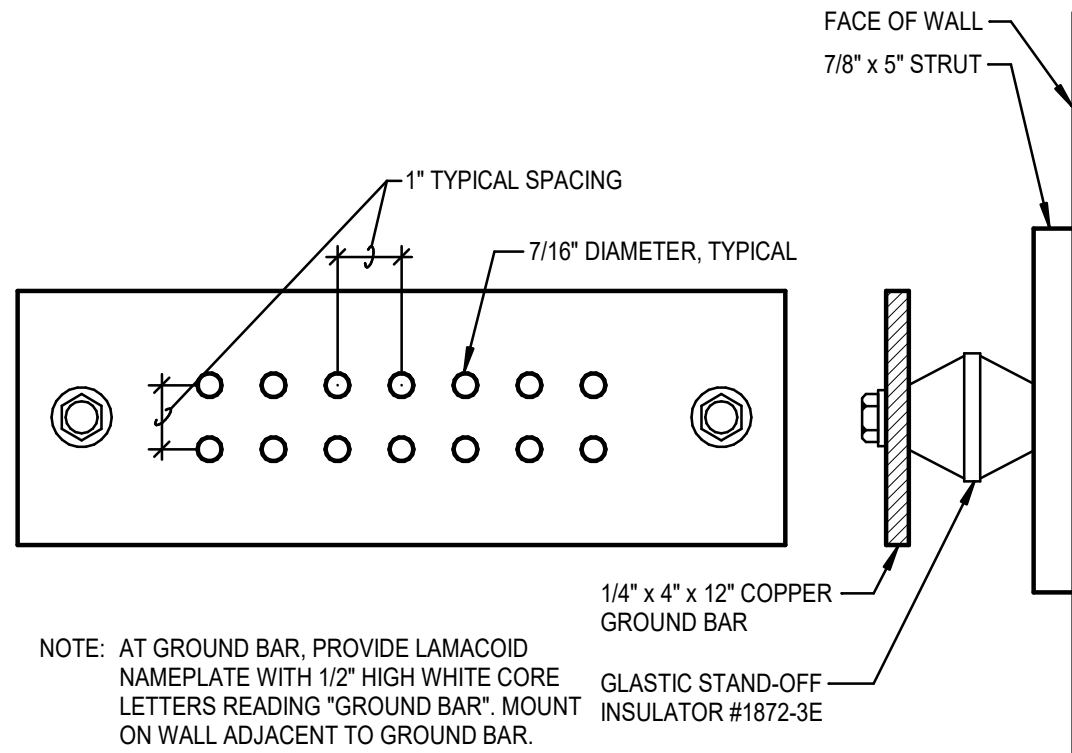




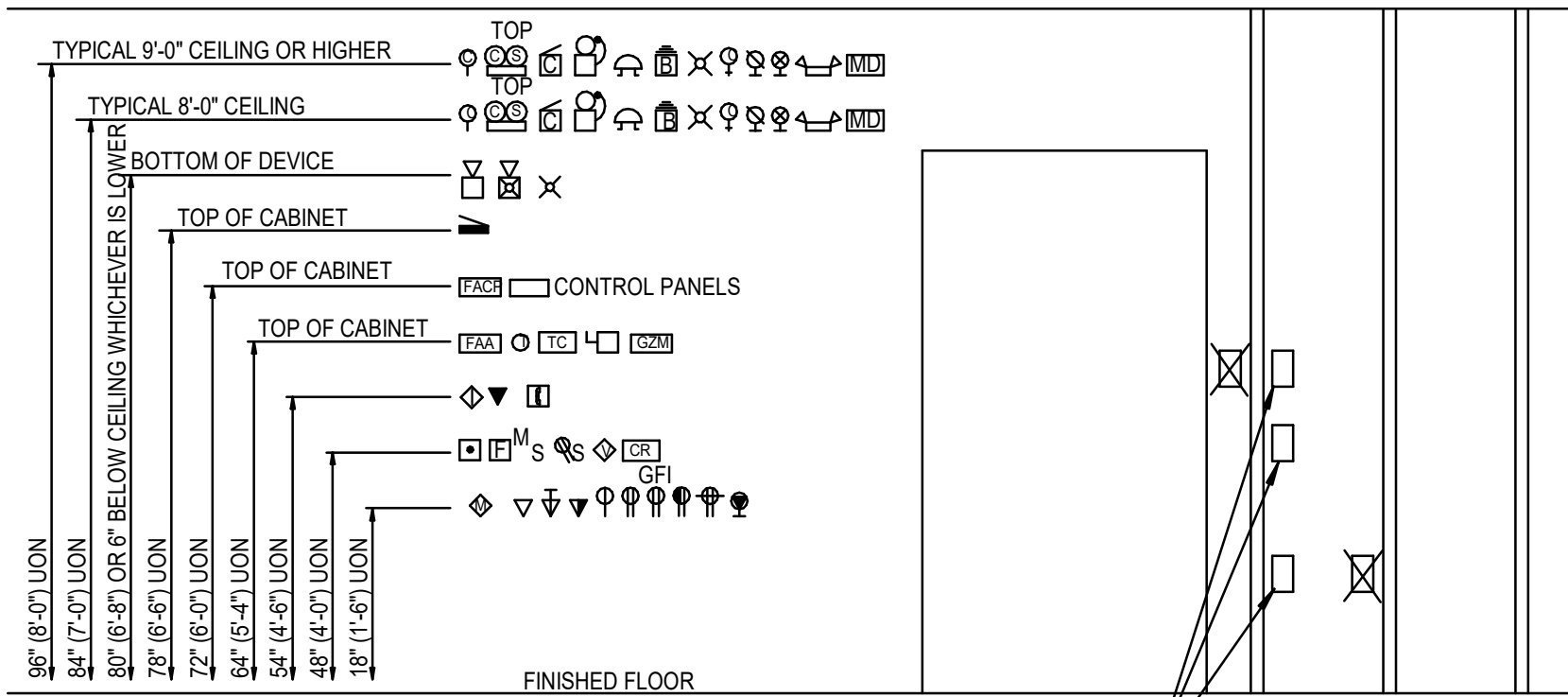
RECEPTACLE BOX SUPPORT DETAIL  
NO SCALE



DUCT BANK DETAIL  
NO SCALE



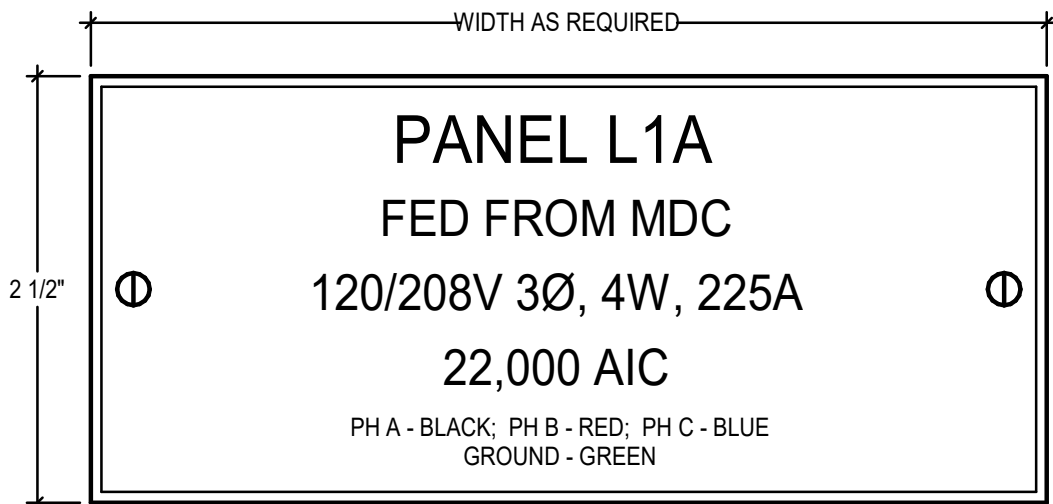
GROUND BAR DETAIL  
NO SCALE



TYPICAL DEVICE MOUNTING HEIGHTS  
NO SCALE

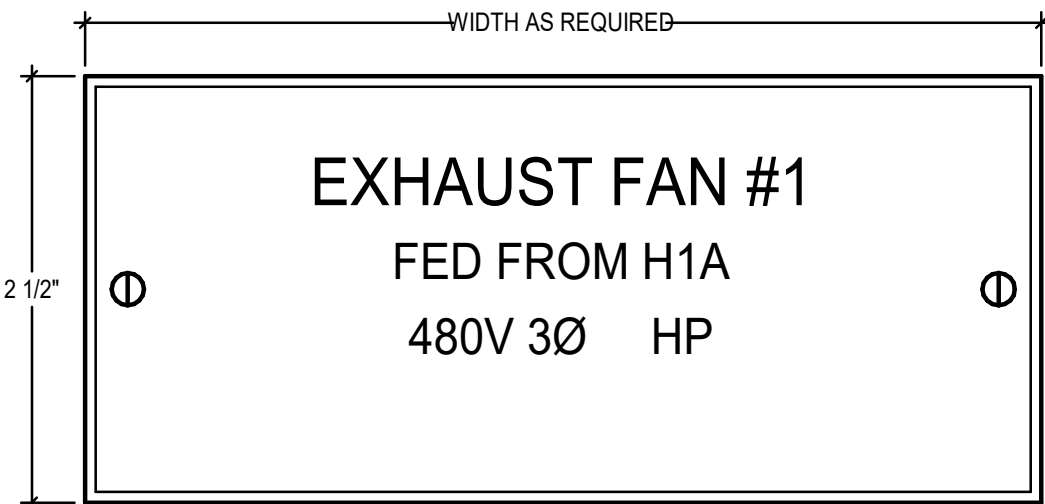
- NOTES:
- HEIGHTS SHOWN ARE TYPICAL TO CENTERLINE OF BOX UNLESS NOTED OTHERWISE.
  - WHERE EVER DEVICES ARE INDICATED TO BE ABOVE DOORS, DEVICE SHALL BE CENTERED BETWEEN TOP OF DOOR TRIM AND CEILING LINE.
  - MOUNTING HEIGHTS SHOWN ON ARCHITECTURAL ELEVATIONS SHALL GOVERN OVER THOSE SHOWN ABOVE.

NOTE: ALL DEVICES INDICATED TO BE INSTALLED AT DIFFERENT MOUNTING HEIGHTS AND LOCATED WITHIN ONE STUD SPACE FROM EACH OTHER SHALL ALIGN VERTICALLY, ON THE SAME SIDE OF THE STUD. WHERE WALL MOUNTED TELEPHONES OCCUR OVER LIGHT SWITCHES, VOLUME CONTROLS, ETC. OFFSET ONE STUD SPACE.



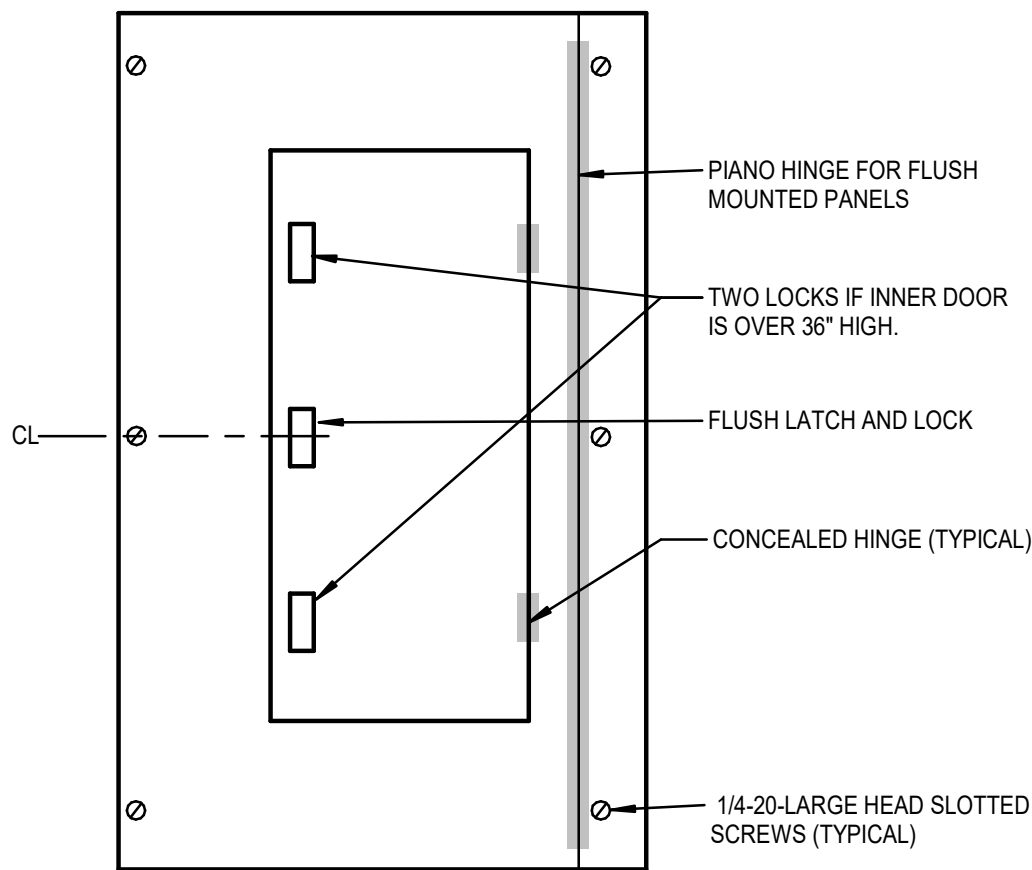
TRANSFORMER AND BRANCH  
PANELBOARD NAMEPLATE DETAIL  
SCALE: FULL

- NOTES:
- REWORD NAMEPLATE FOR FIELD CONDITIONS.



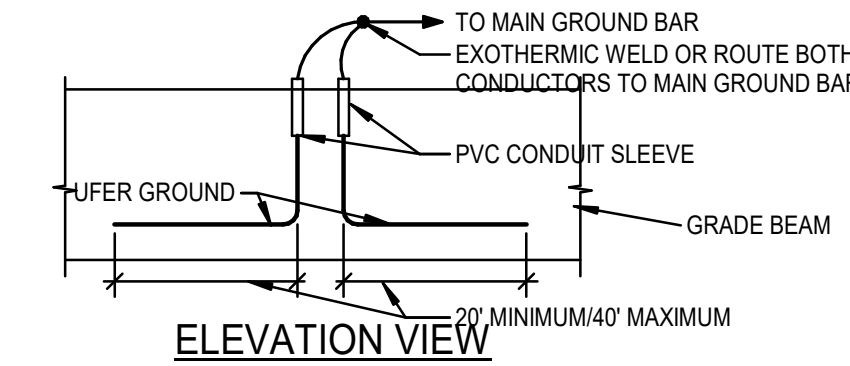
UTILIZATION EQUIPMENT  
NAMEPLATE DETAIL  
SCALE: FULL

- NOTES:
- SEE SPECIFICATIONS FOR ADDITIONAL NAMEPLATE INFORMATION.
  - REWORD NAMEPLATE FOR FIELD CONDITIONS.
  - HP SHALL INDICATE HORSEPOWER.

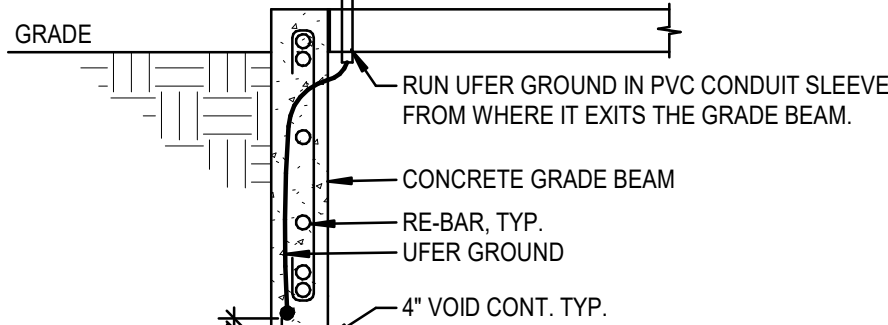


HINGED TRIM TO BOX PANEL FRONT  
NO SCALE

- NOTES:
- ALL BOLTS SHALL HAVE LARGE (3/8") ROUND HEAD. NO WASHERS ALLOWED.
  - TYPICAL FOR ALL 120/208V BRANCH PANELBOARDS.



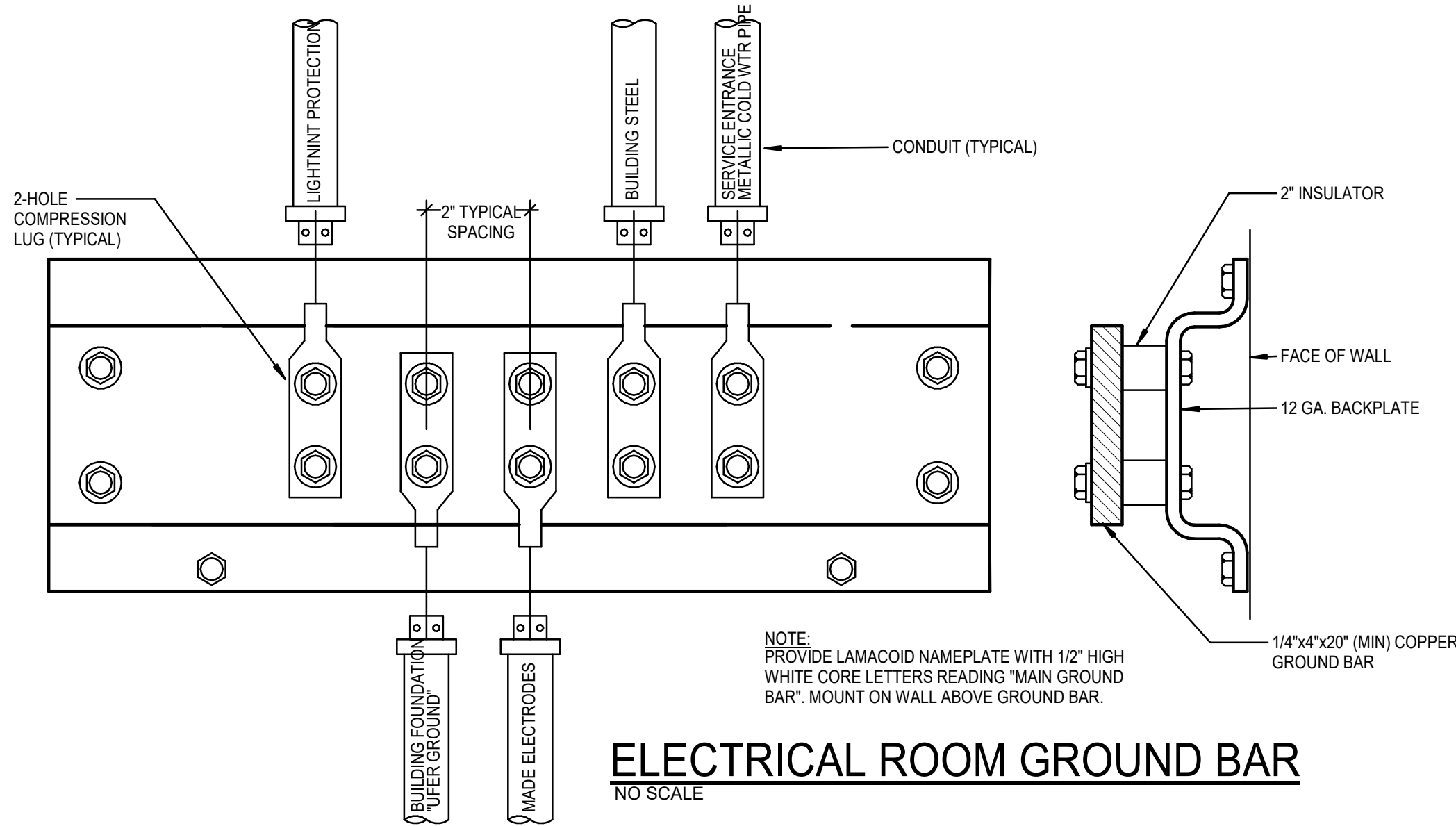
ELEVATION VIEW



SECTION VIEW

- NOTES:
- INSTALL 20" MINIMUM/40" MAXIMUM UFER GROUND CONDUCTOR IN EACH DIRECTION. PROVIDE BARE COPPER CONDUCTOR #4 AWG.
  - ROUTE UFER GROUND CONDUCTOR, THROUGH PVC CONDUIT SLEEVE.
  - AVOID CONTACT WITH RE-BAR IN CONCRETE. DO NOT TIE DIRECTLY TO RE-BAR, USE SEPARATOR APPROVED BY STRUCTURAL.
  - COORDINATE ACTUAL UFER GROUND CONDUCTOR INSTALLATION WITH STRUCTURAL.

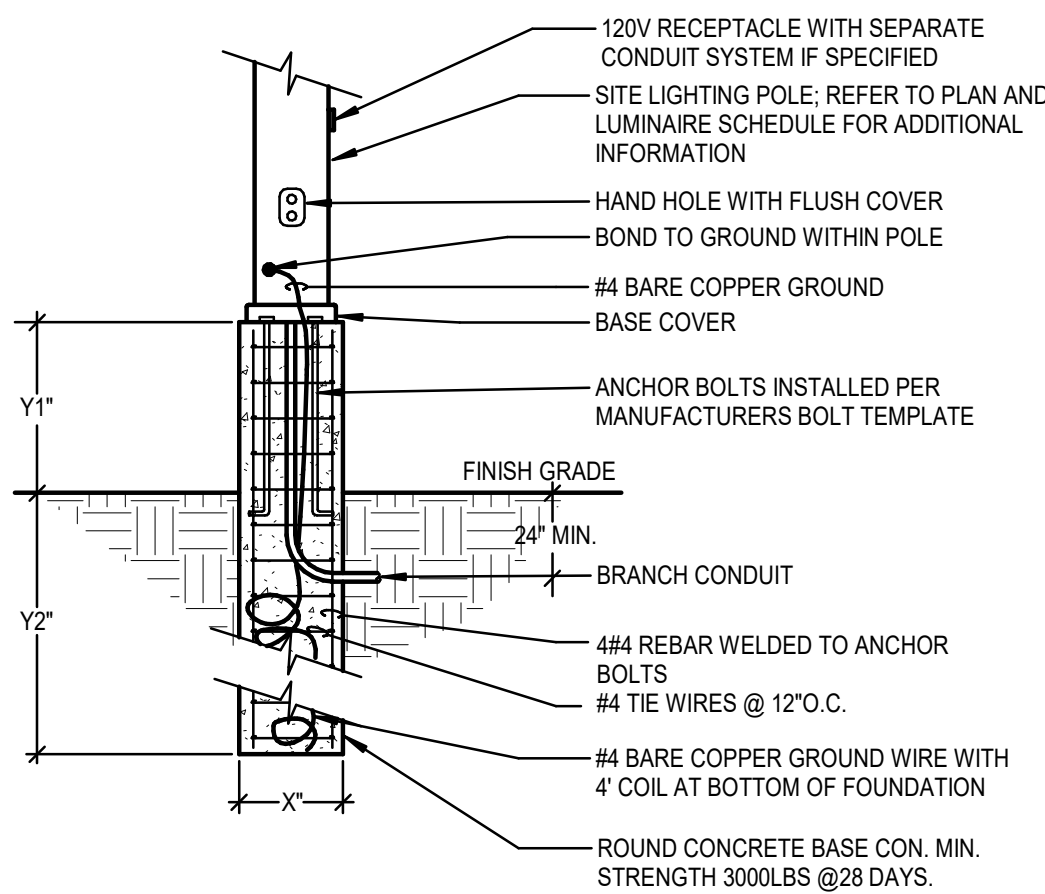
UFER GROUND DETAIL  
NO SCALE



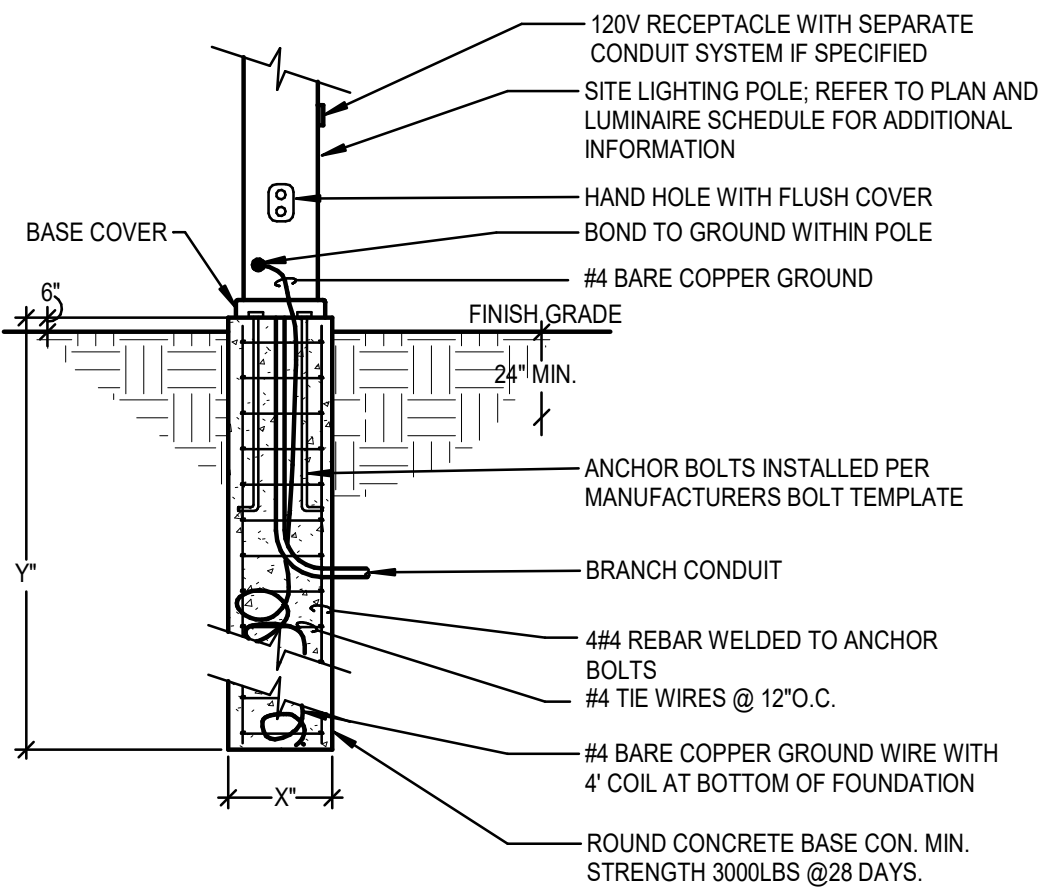
ELECTRICAL ROOM GROUND BAR  
NO SCALE

|                                                                                                                                                                                                     |                 |            |                            |       |                                                                                                        |  |               |  |                   |                   |                  |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|----------------------------|-------|--------------------------------------------------------------------------------------------------------|--|---------------|--|-------------------|-------------------|------------------|-------|
| Print Date: 9/17/2024 12:43:32 AM                                                                                                                                                                   | Sheet Revisions |            |                            |       | ROARING FORK TRANSPORTATION AUTHORITY                                                                  |  | FIR Plans     |  | DETAILS           |                   | Project No./Code |       |
| File Name: CDOT.dwg                                                                                                                                                                                 | Rev.            | Date       | Comments                   | Init. | WEST GLENWOOD TRANSIT CENTER<br>(PHASE 6A)<br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 |  | No Revisions: |  | TRG M535-014      |                   |                  |       |
| Horiz. Scale: As Noted                                                                                                                                                                              |                 | 09/17/2024 | 50% CONSTRUCTION DOCUMENTS | CB    |                                                                                                        |  | Revised:      |  | Designer:         | Structure Numbers | 25924            |       |
| Vert. Scale: As Noted                                                                                                                                                                               |                 |            |                            |       |                                                                                                        |  | Void:         |  | Detailer:         |                   |                  |       |
| Short Elliott Hendrickson Inc.<br>Colorado Center Tower One<br>Suite 6000<br>2000 South Colorado Boulevard<br>Denver, CO 80222-7900<br>Tele. (720) 540-6800<br>(800) 490-4966<br>Fax (720) 540-6801 |                 |            |                            |       |                                                                                                        |  | Sheet Subset: |  | Subset Sheets: of |                   | Sheet Number     | CE503 |

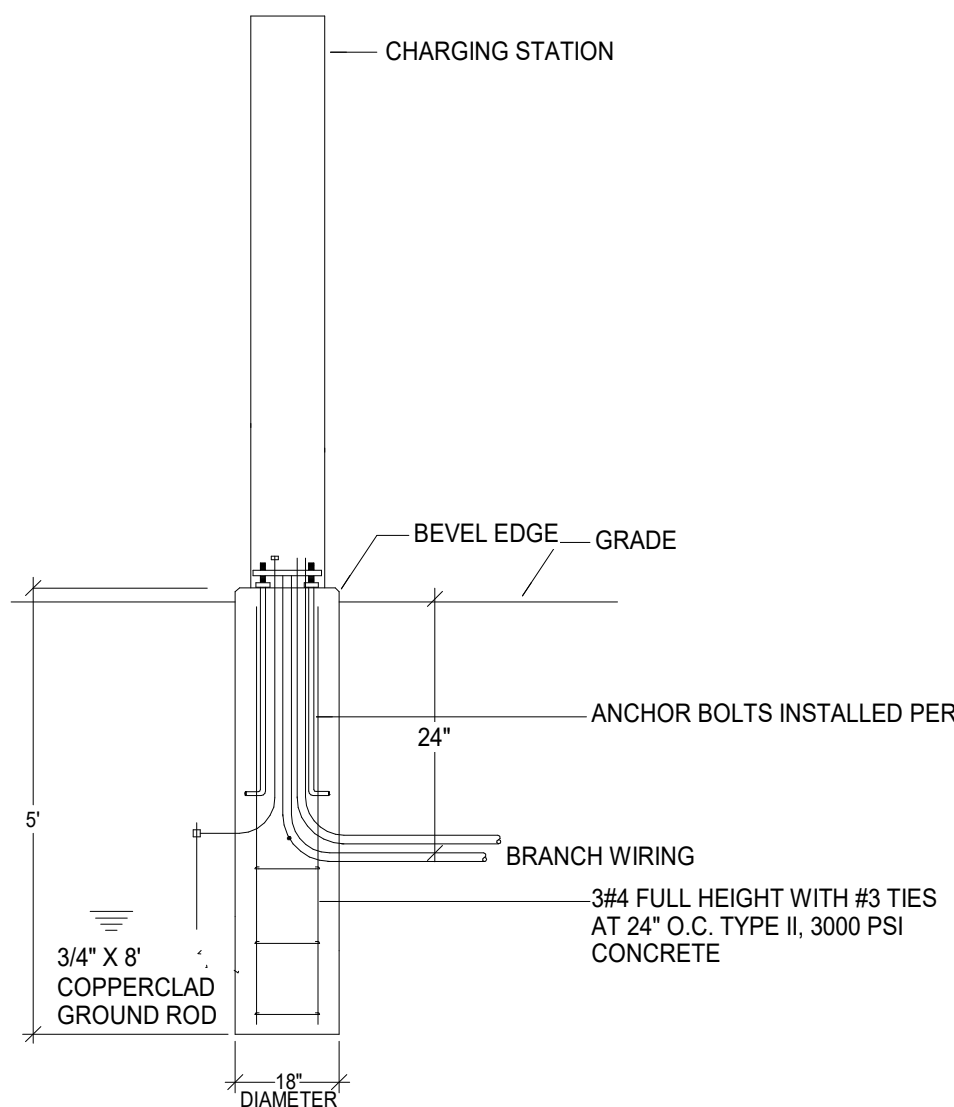




**POLE BASE DETAIL - RAISED**  
NO SCALE



**POLE BASE DETAIL - FLUSH**  
NO SCALE



**CAR CHARGER DETAIL**  
NO SCALE

|                                                                                                                                                                                                                                                        |  |                       |      |             |            |                                                                                                                                                     |                            |    |               |                |              |                   |                  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|------|-------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----|---------------|----------------|--------------|-------------------|------------------|--|
| Print Date: 9/17/2024 12:43:33 AM                                                                                                                                                                                                                      |  | Sheet Revisions       |      |             |            | ROARING FORK TRANSPORTATION AUTHORITY<br><b>WEST GLENWOOD TRANSIT CENTER (PHASE 6A)</b><br>2307 WULFSOHN RD.<br>GLENWOOD SPRINGS,<br>COLORADO 81601 | FIR Plans                  |    | DETAILS       |                |              |                   | Project No./Code |  |
| File Name: CDOT.dwg                                                                                                                                                                                                                                    |  | Rev.                  | Date | Comments    | Init.      |                                                                                                                                                     | No Revisions:              |    |               |                |              |                   | TRG M535-014     |  |
| Horiz. Scale: As Noted                                                                                                                                                                                                                                 |  | Vert. Scale: As Noted |      | <div></div> | 09/17/2024 |                                                                                                                                                     | 50% CONSTRUCTION DOCUMENTS | CB | Revised:      |                | Designer:    | Structure Numbers | 25924            |  |
| <div><div><div></div></div><div>Short Elliott Hendrickson Inc.<br/>Colorado Center Tower One<br/>Suite 6000<br/>2000 South Colorado Boulevard<br/>Denver, CO 80222-7900<br/>Tele: (720) 540-6800<br/>(800) 490-4966<br/>Fax (720) 540-6801</div></div> |  | <div></div>           |      |             |            |                                                                                                                                                     |                            |    | Detailer:     |                | Sheet Number |                   | CE501            |  |
|                                                                                                                                                                                                                                                        |  | <div></div>           |      |             |            |                                                                                                                                                     |                            |    | Sheet Subset: | Subset Sheets: | of           |                   |                  |  |



Work Order: 01-15-25 E  
Input Date: 01/15/25  
Description: RFTA 6A & 6B UPDATED  
UNDERGROUND LINE EXT ESTIMATE

Input by: kimberly  
Last Trans Date: 01/15/25  
Accepted: no  
Requested by:  
Est Compl Date: 01/15/25  
Department:  
Job No: 11525

| Line<br>Num | Whse<br>Code | Stock Item<br>Code | Stock Item<br>Description                       | Sell<br>UOM | Unit Price | Est Qty    | Est Cost   | Act Qty | Act Cost |
|-------------|--------------|--------------------|-------------------------------------------------|-------------|------------|------------|------------|---------|----------|
| 1           | 1            | 51500-12800        | Trans 3ph 750 kva 4w/lf<br>480/277              | ea          | 22,679.13  | 1.0000     | 22,679.13  | .0000   | .00      |
| 2           | 1            | 51500-14000        | Sectionalizer PME/AIS 11                        | ea          | 25,000.00  | 1.0000     | 25,000.00  | .0000   | .00      |
| 3           | 1            | 51500-13200        | Trans 3ph 1000kva 4w/lf                         | ea          | 32,395.32  | 1.0000     | 32,395.32  | .0000   | .00      |
| 4           | 1            | 51500-09000        | Trans 3ph 112.5kva 4w/lf<br>208/120             | ea          | 11,382.40  | 1.0000     | 11,382.40  | .0000   | .00      |
| 5           | 1            | 50600-21000        | Base Lrg 84x84 40200                            | ea          | 673.33     | 3.0000     | 2,019.99   | .0000   | .00      |
| 6           | 1            | 50600-31500        | Vault swgear 72x72 40800                        | ea          | 841.00     | 2.0000     | 1,682.00   | .0000   | .00      |
| 7           | 1            | 50600-22000        | Trans Pad 84x84 3 phs 40                        | ea          | 567.25     | 1.0000     | 567.25     | .0000   | .00      |
| 8           | 1            | 50600-21500        | Vault 4x4 Sq-4'High 4070                        | ea          | 832.00     | 2.0000     | 1,664.00   | .0000   | .00      |
| 9           | 1            | 50600-22500        | Trans Pad 72x72 3 phs 40                        | ea          | 564.57     | 2.0000     | 1,129.14   | .0000   | .00      |
| 10          | 1            | 50600-10000        | Lid 56" Dia Round 40400                         | ea          | 709.50     | 3.0000     | 2,128.50   | .0000   | .00      |
| 11          | 1            | 50600-11500        | Vault Round 4x4 40750                           | ea          | 591.70     | 3.0000     | 1,775.10   | .0000   | .00      |
| 12          | 1            | 50600-11000        | Base Sm 56x56 40150                             | ea          | 294.04     | 3.0000     | 882.12     | .0000   | .00      |
| 13          | 1            | 51000-00700        | splice pri 4/0 600a 220m                        | ea          | 66.57      | 3.0000     | 199.71     | .0000   | .00      |
| 14          | 1            | 14500-02400        | ground rod                                      | ea          | 21.81      | 3.0000     | 65.43      | .0000   | .00      |
| 15          | 1            | 14500-02500        | clamp ground rod                                | ea          | 1.92       | 3.0000     | 5.76       | .0000   | .00      |
| 16          | 1            | 14500-02700        | trans bonding bolt                              | ea          | 5.59       | 6.0000     | 33.54      | .0000   | .00      |
| 17          | 1            | 50500-08000        | conn blk 6-500 8 bolt mo<br>USG2-500 R86        | ea          | 32.89      | 12.0000    | 394.68     | .0000   | .00      |
| 18          | 1            | 50000-02500        | ld brk elbow 200a 4/0 22<br>with seal kit       | ea          | 75.05      | 18.0000    | 1,350.90   | .0000   | .00      |
| 19          | 1            | 18500-01100        | conn comp 3/0-4/0 CU                            | ea          | 6.88       | 21.0000    | 144.48     | .0000   | .00      |
| 20          | 1            | 50500-24000        | Spade #2 Str Comp                               | ea          | 6.64       | 3.0000     | 19.92      | .0000   | .00      |
| 21          | 1            | 25000-02500        | Meter Box 13t\w test swi<br>10 Pole Test Switch | ea          | 458.27     | 3.0000     | 1,374.81   | .0000   | .00      |
| 22          | 1            | 26000-54900        | CT 500:5 SPADE                                  | EA          | 168.43     | 9.0000     | 1,515.87   | .0000   | .00      |
| 23          | 1            | 54600-60000        | 6" pvc Pipe W/Cplg Schd                         | ft          | 8.59       | 1,000.0000 | 8,590.00   | .0000   | .00      |
| 24          | 1            | 53000-01500        | UG cable 4/0 15kv 220m p                        | ft          | 4.53       | 3,000.0000 | 13,590.00  | .0000   | .00      |
| 25          | 1            | 54600-69000        | 6" pvc 90 Degree Elbow S                        | ea          | 79.64      | 1.0000     | 79.64      | .0000   | .00      |
| 26          | 1            | 54600-64500        | 6" pvc 45 Degree Elbow S                        | ea          | 71.22      | 2.0000     | 142.44     | .0000   | .00      |
| 27          | 69           | 2300004            | LABOR - FOUR MAN CREW                           | HR          | 260.00     | 48.0000    | 12,480.00  | .0000   | .00      |
| 28          | 89           | 2400013            | Crane Truck<br>Hourly Rate                      | hr          | 120.00     | 16.0000    | 1,920.00   | .0000   | .00      |
| 29          | 89           | 2400010            | Service Truck<br>Hourly Rate                    | hr          | 25.00      | 80.0000    | 2,000.00   | .0000   | .00      |
| 30          | 89           | 2400022            | Wire Puller<br>Hourly Rate                      | hr          | 20.00      | 16.0000    | 320.00     | .0000   | .00      |
| 31          | 89           | 2400019            | Trailers<br>Hourly Rate                         | hr          | 25.00      | 16.0000    | 400.00     | .0000   | .00      |
|             |              |                    |                                                 |             |            | 4,283.0000 | 147,932.13 | .0000   | .00      |



# **APPENDIX**

## **RFTA West Glenwood Transit Center & Administration Building (Phase 6A, Phase 6B, and Phase 8)**

Glenwood Springs, CO

September 2024

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## **Appendix A: Proof of Ownership**



# Land Title Guarantee Company

## CUSTOMER DISTRIBUTION

Date: 07-07-2004

Our Order Number: GW243987-3

Property Address:

*If you have any inquiries or require further assistance, please contact one of the numbers below:*

**For Title Assistance:**

**Glenwood Springs "GW" Unit**

**1317 GRAND AVE #200**

**GLENWOOD SPRINGS, CO 81601**

**Phone: 970-945-2610**

**Fax: 970-945-4784**

**For Closing Assistance:**

**Ellen Lipscomb**

**1317 GRAND AVE #200**

**GLENWOOD SPRINGS, CO 81601**

**Phone: 970-945-2610**

**Fax: 970-945-4784**

**EMail: elipscomb@ltgc.com**

**GLENWOOD MEADOWS, LLC**

**1315 SAGE COURT**

**ASPEN, CO 81611**

**Copies: 1**

**Sent Via US Postal Service**

✓ **ROARING FORK TRANSPORTATION AUTHORITY**

**051 SERVICE CENTER DR**

**ASPEN CO 81611**

**Attn: DAN BLANKENSHIP**

**Copies: 1**

**Sent Via US Postal Service**

**BALCOMB & GREEN**

**PO DRAWER 790**

**818 COLORADO AVE**

**GLENWOOD SPRINGS, CO 81602**

**Attn: THOMAS J. HARTERT**

**Phone: 970-945-6546**

**Fax: 970-945-9769**

**Copies: 1**

**Sent Via US Postal Service**





## Land Title Guarantee Company

Date: 07-07-2004

Our Order Number: GW243987-3

Property Address:

Buyer/Borrower:

ROARING FORK TRANSPORTATION AUTHORITY

Seller/Owner:

GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY

Need a map or directions for your upcoming closing? Check out Land Title's web site at [www.ltgc.com](http://www.ltgc.com) for directions to any of our 54 office locations.

### ESTIMATE OF TITLE FEES

|                                           |          |
|-------------------------------------------|----------|
| Alta Owners Policy 10-17-92               | \$846.00 |
| Deletion of Standard Exception(s) (Owner) | \$20.00  |

If Land Title Guarantee Company will be closing this transaction, above fees will be collected at that time.

|              |                 |
|--------------|-----------------|
| <b>TOTAL</b> | <b>\$866.00</b> |
|--------------|-----------------|

Old Republic National Title Insurance Company

ALTA COMMITMENT

Our Order No. GW243987-3

Schedule A

Cust. Ref.:

Property Address:

1. **Effective Date:** June 18, 2004 at 5:00 P.M.

2. **Policy to be Issued, and Proposed Insured:**

"ALTA" Owner's Policy 10-17-92

\$750,000.00

Proposed Insured:

ROARING FORK TRANSPORTATION AUTHORITY

3. **The estate or interest in the land described or referred to in this Commitment and covered herein is:**

A Fee Simple

4. **Title to the estate or interest covered herein is at the effective date hereof vested in:**

GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY

5. **The land referred to in this Commitment is described as follows:**

SEE ATTACHED PAGE(S) FOR LEGAL DESCRIPTION

**LEGAL DESCRIPTION**

PARCEL A  
GLENWOOD MEADOWS NO. 1  
ACCORDING TO THE PLAT THEREOF RECORDED \_\_\_\_\_ UNDER RECEPTION NO. \_\_\_\_\_  
--

AKA

A PARCEL OF LAND SITUATED IN THE SW1/4 OF SECTION 5, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF GARFIELD, STATE OF COLORADO; SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 5; THENCE N 66 DEGREES 32' 58" E 1563.49 FEET TO A POINT ON THE NORTHERLY RIGHT OF WAY OF WULFSON ROAD, THE POINT OF BEGINNING; THENCE N 70 DEGREES 03' 24" W ALONG SAID NORTHERLY RIGHT OF WAY A DISTANCE OF 522.96 FEET; THENCE CONTINUING ALONG SAID RIGHT OF WAY ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 337.50 FEET AND A CENTRAL ANGLE OF 28 DEGREES 23' 29", A DISTANCE OF 167.24 FEET (CHORD BEARS N 84 DEGREES 15' 08" W A DISTANCE OF 615.53 FEET); THENCE CONTINUING ALONG SAID RIGHT OF WAY S 81 DEGREES 33' 08" W A DISTANCE OF 198.68 FEET; THENCE CONTINUING ALONG SAID RIGHT OF WAY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 1,260.00 FEET AND A CENTRAL ANGLE OF 01 DEGREES 42' 55", A DISTANCE OF 37.71 FEET (CHORD BEARS N 31 DEGREES 49' 35" W, A DISTANCE OF 37.72 FEET) TO A POINT ON THE SOUTHERLY RIGHT OF WAY OF MIDLAND AVENUE; THENCE LEAVING THE NORTHERLY RIGHT OF WAY OF WULFSON ROAD N 62 DEGREES 28' 35" E ALONG THE SOUTHERLY RIGHT OF WAY OF MIDLAND AVENUE A DISTANCE OF 262.30 FEET; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT OF WAY N 70 DEGREES 48' 52" E A DISTANCE OF 233.79 FEET; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT OF WAY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 400.00 FEET AND A CENTRAL ANGLE OF 19 DEGREES 48' 21", A DISTANCE OF 138.27 FEET (CHORD BEARS N 80 DEGREES 43' 03" E, A DISTANCE OF 137.58 FEET); THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT OF WAY S 89 DEGREES 22' 47" E A DISTANCE OF 220.22 FEET; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT OF WAY S 04 DEGREES 05' 51" W A DISTANCE OF 84.94 FEET; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT OF WAY S 88 DEGREES 21' 25" E A DISTANCE OF 29.12 FEET; THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT OF WAY N 84 DEGREES 12' 24" E A DISTANCE OF 200.33 FEET; THENCE LEAVING SAID SOUTHERLY RIGHT OF WAY S 24 DEGREES 24' 59" W A DISTANCE OF 384.73 FEET TO THE POINT OF BEGINNING.

COUNTY OF GARFIELD  
STATE OF COLORADO

ALTA COMMITMENT

Schedule B-1

(Requirements)

Our Order No. GW243987-3

The following are the requirements to be complied with:

Payment to or for the account of the grantors or mortgagors of the full consideration for the estate or interest to be insured.

Proper instrument(s) creating the estate or interest to be insured must be executed and duly filed for record, to-wit:

1. RELEASE OF DEED OF TRUST DATED SEPTEMBER 06, 1996, FROM GLENWOOD MEADOWS, LLC TO THE PUBLIC TRUSTEE OF GARFIELD COUNTY FOR THE USE OF LAWRENCE MARX AND ROBERT APPEL TO SECURE THE SUM OF \$2,000,000.00 RECORDED SEPTEMBER 06, 1996, IN BOOK 991 AT PAGE 438.

AFFIDAVIT OF PRINCIPAL BALANCE OWING AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED MAY 19, 2004 IN BOOK 1589 AT PAGE 194.

SUBORDINATION AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED MAY 19, 2004 IN BOOK 1589 AT PAGE 201.

2. RELEASE OF DEED OF TRUST DATED OCTOBER 16, 1998, FROM GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY TO THE PUBLIC TRUSTEE OF GARFIELD COUNTY FOR THE USE OF GLENWOOD LAND COMPANY, LLC TO SECURE THE SUM OF \$2,586,940.00 RECORDED NOVEMBER 23, 1998, IN BOOK 1099 AT PAGE 608.

SUBORDINATION AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED FEBRUARY 02, 2004 IN BOOK 1558 AT PAGE 562.

SUBORDINATION AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED MAY 19, 2004 IN BOOK 1589 AT PAGE 195.

3. RECORDATION OF THE PLAT CREATING THE LEGAL DESCRIPTION TO BE INSURED HEREIN.
4. SPECIAL WARRANTY DEED FROM GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY TO ROARING FORK TRANSPORTATION AUTHORITY CONVEYING SUBJECT PROPERTY.

NOTE: ITEMS 1-3 OF THE STANDARD EXCEPTIONS ARE HEREBY DELETED.

ALTA COMMITMENT

Schedule B-1

(Requirements)

Our Order No. GW243987-3

Continued:

UPON THE APPROVAL OF THE COMPANY AND THE RECEIPT OF A NOTARIZED FINAL LIEN AFFIDAVIT, ITEM NO. 4 OF THE STANDARD EXCEPTIONS WILL BE AMENDED AS FOLLOWS:

ITEM NO. 4 OF THE STANDARD EXCEPTIONS IS DELETED AS TO ANY LIENS OR FUTURE LIENS RESULTING FROM WORK OR MATERIAL FURNISHED AT THE REQUEST OF GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY.  
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY SHALL HAVE NO LIABILITY FOR ANY LIENS ARISING FROM WORK OR MATERIAL FURNISHED AT THE REQUEST OF ROARING FORK TRANSPORTATION AUTHORITY.

NOTE: ITEM 5 OF THE STANDARD EXCEPTIONS WILL BE DELETED IF LAND TITLE GUARANTEE COMPANY CONDUCTS THE CLOSING OF THE CONTEMPLATED TRANSACTION(S) AND RECORDS THE DOCUMENTS IN CONNECTION THEREWITH.

NOTE: UPON PROOF OF PAYMENT OF 2003 TAXES, ITEM 7 UNDER SCHEDULE B-2 WILL BE DELETED AND ITEM 6 WILL BE AMENDED TO READ:

TAXES AND ASSESSMENTS FOR THE YEAR 2004 AND SUBSEQUENT YEARS.

ITEM 8 UNDER SCHEDULE B-2 WILL BE DELETED UPON PROOF THAT THE WATER AND SEWER CHARGES ARE PAID UP TO DATE.



ALTA COMMITMENT

Schedule B-2

(Exceptions)

Our Order No. GW243987-3

The policy or policies to be issued will contain exceptions to the following unless the same are disposed of to the satisfaction of the Company:

1. Rights or claims of parties in possession not shown by the public records.
2. Easements, or claims of easements, not shown by the public records.
3. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, and any facts which a correct survey and inspection of the premises would disclose and which are not shown by the public records.
4. Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.
5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date the proposed insured acquires of record for value the estate or interest or mortgage thereon covered by this Commitment.
6. Taxes and assessments not yet due or payable and special assessments not yet certified to the Treasurer's office.
7. Any unpaid taxes or assessments against said land.
8. Liens for unpaid water and sewer charges, if any.
9. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 270.
10. EASEMENT AS GRANTED TO ROCKY MOUNTAIN NATURAL GAS COMPANY, INC. IN INSTRUMENT RECORDED JANUARY 31, 1962 IN BOOK 339 AT PAGE 88.
11. TERMS, CONDITIONS AND PROVISIONS OF RIGHT OF WAY ACQUISITION AGREEMENT RECORDED SEPTEMBER 16, 1994 IN BOOK 916 AT PAGE 864.
12. UTILITY EASEMENT AS GRANTED TO CITY OF GLENWOOD SPRINGS, COLORADO IN INSTRUMENT RECORDED FEBRUARY 01, 2000 IN BOOK 1171 AT PAGE 191.
13. TERMS, CONDITIONS AND PROVISIONS OF ANNEXATION & DEVELOPMENT AGREEMENT (PRIVATE), GLENWOOD MEADOWS, LLC ANNEXATION RECORDED DECEMBER 06, 2002 IN BOOK 1414 AT PAGE 526.
4. TERMS, CONDITIONS AND PROVISIONS OF AMENDMENT TO ANNEXATION RECORDED MAY

ALTA COMMITMENT

Schedule B-2

(Exceptions)

Our Order No. GW243987-3

The policy or policies to be issued will contain exceptions to the following unless the same are disposed of to the satisfaction of the Company:

06, 2004 IN BOOK 1585 AT PAGE 438.

15. EASEMENTS, RIGHTS OF WAY AND ALL MATTERS SHOWN ON THE PLAT RECORDED \_ \_ \_ \_ \_  
\_ \_ UNDER RECEPTION NO. \_ \_ \_ \_ \_ .

# LAND TITLE GUARANTEE COMPANY

## DISCLOSURE STATEMENTS

Note: Pursuant to CRS 10-11-122, notice is hereby given that:

- A) The subject real property may be located in a special taxing district.
- B) A Certificate of Taxes Due listing each taxing jurisdiction may be obtained from the County Treasurer's authorized agent.
- C) The information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder, or the County Assessor.

Note: Effective September 1, 1997, CRS 30-10-406 requires that all documents received for recording or filing in the clerk and recorder's office shall contain a top margin of at least one inch and a left, right and bottom margin of at least one half of an inch. The clerk and recorder may refuse to record or file any document that does not conform, except that, the requirement for the top margin shall not apply to documents using forms on which space is provided for recording or filing information at the top margin of the document.

Note: Colorado Division of Insurance Regulations 3-5-1, Paragraph C of Article VII requires that "Every title entity shall be responsible for all matters which appear of record prior to the time of recording whenever the title entity conducts the closing and is responsible for recording or filing of legal documents resulting from the transaction which was closed". Provided that Land Title Guarantee Company conducts the closing of the insured transaction and is responsible for recording the legal documents from the transaction, exception number 5 will not appear on the Owner's Title Policy and the Lenders Policy when issued.

Note: Affirmative mechanic's lien protection for the Owner may be available (typically by deletion of Exception no. 4 of Schedule B, Section 2 of the Commitment from the Owner's Policy to be issued) upon compliance with the following conditions:

- A) The land described in Schedule A of this commitment must be a single family residence which includes a condominium or townhouse unit.
- B) No labor or materials have been furnished by mechanics or material-men for purposes of construction on the land described in Schedule A of this Commitment within the past 6 months.
- C) The Company must receive an appropriate affidavit indemnifying the Company against un-filed mechanic's and material-men's liens.
- D) The Company must receive payment of the appropriate premium.
- E) If there has been construction, improvements or major repairs undertaken on the property to be purchased within six months prior to the Date of the Commitment, the requirements to obtain coverage for unrecorded liens will include: disclosure of certain construction information; financial information as to the seller, the builder and or the contractor; payment of the appropriate premium fully executed Indemnity Agreements satisfactory to the company, and, any additional requirements as may be necessary after an examination of the aforesaid information by the Company.

No coverage will be given under any circumstances for labor or material for which the insured has contracted for or agreed to pay.

Note: Pursuant to CRS 10-11-123, notice is hereby given:

This notice applies to owner's policy commitments containing a mineral severance instrument exception, or exceptions, in Schedule B, Section 2.

- A) That there is recorded evidence that a mineral estate has been severed, leased, or otherwise conveyed from the surface estate and that there is a substantial likelihood that a third party holds some or all interest in oil, gas, other minerals, or geothermal energy in the property; and
- B) That such mineral estate may include the right to enter and use the property without the surface owner's permission.

Nothing herein contained will be deemed to obligate the company to provide any of the coverages referred to herein unless the above conditions are fully satisfied.

## JOINT NOTICE OF PRIVACY POLICY

OF

### LAND TITLE GUARANTEE COMPANY AND LAND TITLE INSURANCE CORPORATION AND OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with a nonaffiliated third party unless the institution provides you with a notice of its privacy policies and practices, such as the type of information that it collects about you and the categories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of Land Title Guarantee Company and Land Title Insurance Corporation and Old Republic National Title Insurance Company.

We may collect nonpublic personal information about you from the following sources:

- Information we receive from you such as on applications or other forms.
- Information about your transactions we secure from our files, or from our affiliates or others.
- Information we receive from a consumer reporting agency.
- Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

We may disclose any of the above information that we collect about our customers or former customers to our affiliates or to nonaffiliated third parties as permitted by law.

We also may disclose this information about our customers or former customers to the following types of nonaffiliated companies that perform marketing services on our behalf or with whom we have joint marketing agreements:

- \* Financial service providers such as companies engaged in banking, consumer finance, securities and insurance.
- \* Non-financial companies such as envelope stuffers and other fulfillment service providers.

**WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.**

We restrict access to nonpublic personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.



# Land Title Guarantee Company

CUSTOMER DISTRIBUTION

Date: 05-21-2004

Our Order Number: GW243987

Property Address:

*If you have any inquiries or require further assistance, please contact one of the numbers below:*

**For Title Assistance:**

Glenwood Springs "GW" Unit

1317 GRAND AVE #200

GLENWOOD SPRINGS, CO 81601

Phone: 970-945-2610

Fax: 970-945-4784

**For Closing Assistance:**

Ellen Lipscomb

1317 GRAND AVE #200

GLENWOOD SPRINGS, CO 81601

Phone: 970-945-2610

Fax: 970-945-4784

EMail: elipscomb@ltgc.com

GLENWOOD MEADOWS, LLC

1315 SAGE COURT

ASPEN, CO 81611

Copies: 1

Sent Via US Postal Service

✓ ROARING FORK TRANSPORTATION AUTHORITY

051 SERVICE CENTER DR

ASPEN CO 81611

Attn: DAN BLANKENSHIP

Copies: 1

Sent Via US Postal Service

BALCOMB & GREEN

PO DRAWER 790

818 COLORADO AVE

GLENWOOD SPRINGS, CO 81602

Attn: THOMAS J. HARTERT

Phone: 970-945-6546

Fax: 970-945-9769

Copies: 1

Sent Via US Postal Service





# Land Title Guarantee Company

Date: 05-21-2004

Our Order Number: GW243987

Property Address:

Buyer/Borrower:

ROARING FORK TRANSPORTATION AUTHORITY

Seller/Owner:

GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY

Need a map or directions for your upcoming closing? Check out Land Title's web site at [www.ltgc.com](http://www.ltgc.com) for directions to any of our 54 office locations.

## ESTIMATE OF TITLE FEES

|                                           |          |
|-------------------------------------------|----------|
| Alta Owners Policy 10-17-92               | \$846.00 |
| Deletion of Standard Exception(s) (Owner) | \$20.00  |

**TOTAL**

**\$866.00**

# Commitment to Insure

ALTA Commitment - 1970 Rev.



OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY, a Minnesota corporation, herein called the Company, for a valuable consideration, hereby commits to issue its policy or policies of title insurance, as identified in Schedule A, in favor of the proposed Insured named in Schedule A, as owner or mortgagee of the estate or interest covered hereby in the land described or referred to in Schedule A, upon payment of the premiums and charges therefor; all subject to the provisions of Schedule A and B and to the Conditions and Stipulations hereof.

This Commitment shall be effective only when the identity of the proposed Insured and the amount of the policy or policies committed for have been inserted in Schedule A hereof by the Company, either at the time of the issuance of this Commitment or by subsequent endorsement.

This Commitment is preliminary to the issuance of such policy or policies of title insurance and all liability and obligations hereunder shall cease and terminate six months after the effective date hereof or when the policy or policies committed for shall issue, whichever first occurs, provided that the failure to issue such policy or policies is not the fault of the Company.

## CONDITIONS AND STIPULATIONS

1. The term "mortgage", when used herein, shall include deed of trust, trust deed, or other security instrument.
2. If the proposed Insured has or acquires actual knowledge of any defect, lien, encumbrance, adverse claim or other

matter affecting the estate or interest or mortgage thereon covered by this Commitment other than those shown in Schedule B hereof, and shall fail to disclose such knowledge to the Company in writing, the Company shall be relieved from liability for any loss or damage resulting from any act of reliance hereon to the extent the Company is prejudiced by failure of the proposed Insured to so disclose such knowledge. If the proposed Insured shall disclose such knowledge to the Company, or if the Company otherwise acquires actual knowledge of any such defect, lien, encumbrance, adverse claim or other matter, the Company at its option may amend Schedule B of this Commitment accordingly, but such amendment shall not relieve the Company from liability previously incurred pursuant to paragraph 3 of these Conditions and Stipulations.

3. Liability of the company under this Commitment shall be only to the named proposed Insured and such parties included under the definition of Insured in the form of policy or policies committed for and only for actual loss incurred in reliance hereon in undertaking in good faith (a) to comply with the requirements hereof or (b) to eliminate exceptions shown in Schedule B, or (c) to acquire or create the estate or interest or mortgage thereon covered by this Commitment. In no event shall such liability exceed the amount stated in Schedule A for the policy or policies committed for and such liability is subject to the insuring provisions and the Conditions and Stipulations and the Exclusions from Coverage of the form of policy or policies committed, for in favor of the proposed Insured which are hereby incorporated by reference and made a part of this Commitment except as expressly modified herein.

4. Any action or actions or rights of action that the proposed Insured may have or may bring against the Company arising out of the status of the title to the estate or interest or the status of the mortgage thereon covered by this Commitment must be based on and are subject to the provisions of this Commitment.

## STANDARD EXCEPTIONS

In addition to the matters contained in the Conditions and Stipulations and Exclusions from Coverage above referred to, this Commitment is also subject to the following:

1. Rights or claims of parties in possession not shown by the public records.
2. Easements, or claims of easements, not shown by the public records.
3. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, and any facts which a correct survey and inspection of the premises would disclose and which are not shown by the public records.
4. Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.
5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date the proposed insured acquires of record for value the estate or interest or mortgage thereon covered by this Commitment.

IN WITNESS WHEREOF, Old Republic National Title Insurance Company has caused its corporate name and seal to be hereunto affixed by its duly authorized officers on the date shown in Schedule A, to be valid when countersigned by a validating officer or other authorized signatory.

OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY  
A Stock Company  
400 Second Avenue South  
Minneapolis, Minnesota 55401  
(612) 371-1111

*Shaun M. Erickson*

Authorized Signature



*[Signature]*  
*[Signature]*

Old Republic National Title Insurance Company

ALTA COMMITMENT

Our Order No. GW243987

Schedule A

Cust. Ref.:

Property Address:

1. Effective Date: May 07, 2004 at 5:00 P.M.

2. Policy to be Issued, and Proposed Insured:

"ALTA" Owner's Policy 10-17-92

\$750,000.00

Proposed Insured:  
ROARING FORK TRANSPORTATION AUTHORITY

3. The estate or interest in the land described or referred to in this Commitment and covered herein is:

A Fee Simple

4. Title to the estate or interest covered herein is at the effective date hereof vested in:

GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY

5. The land referred to in this Commitment is described as follows:

SEE ATTACHED PAGE(S) FOR LEGAL DESCRIPTION

# LEGAL DESCRIPTION

A PORTION OF

A PARCEL OF LAND SITUATED IN THE S1/2S1/2 OF SECTION 5, THE SE1/4SE1/4 OF SECTION 6, THE NE1/4NE1/4 OF SECTION 7, THE N1/2 OF SECTION 8 AND THE NW1/4NW1/4 OF SECTION 9, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN; SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 5, THE POINT OF BEGINNING; THENCE S 75 DEGREES 55' 37" W A DISTANCE OF 1316.16 FEET; THENCE N 01 DEGREES 07' 55" E A DISTANCE OF 582.46 FEET; THENCE N 90 DEGREES 00' 00" E A DISTANCE OF 1265.15 FEET; THENCE S 30 DEGREES 38' 55" E A DISTANCE OF 522.34 FEET THENCE S 19 DEGREES 31' 13" E A DISTANCE OF 160.53 FEET; THENCE S 12 DEGREES 53' 54" E A DISTANCE OF 181.17 FEET; THENCE N 47 DEGREES 17' 45" E A DISTANCE OF 1171.28 FEET; THENCE ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 1260.00 FEET AND A CENTRAL ANGLE OF 10 DEGREES 27' 43", A DISTANCE OF 230.07 FEET (CHORD BEARS N 65 DEGREES 22' 14" W 229.75 FEET); THENCE N 63 DEGREES 26' 47" E A DISTANCE OF 283.45 FEET; THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 137.50 FEET AND A CENTRAL ANGLE OF 24 DEGREES 20' 19", A DISTANCE OF 58.41 FEET (CHORD BEARS N 51 DEGREES 16' 35" E 57.97 FEET); THENCE N 63 DEGREES 30' 55" E A DISTANCE OF 61.83 FEET; THENCE S 70 DEGREES 03' 24" E A DISTANCE OF 42.54 FEET; THENCE N 19 DEGREES 56' 36" E A DISTANCE OF 75.00 FEET; THENCE N 70 DEGREES 03' 24" W A DISTANCE OF 522.96 FEET; THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 337.50 FEET AND A CENTRAL ANGLE OF 28 DEGREES 23' 27", A DISTANCE OF 167.24 FEET (CHORD BEARS N 84 DEGREES 15' 08" W 165.53 FEET); THENCE SOUTH 81 DEGREES 33' 05" W A DISTANCE OF 198.69 FEET; THENCE ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 1260.00 FEET AND A CENTRAL ANGLE OF 01 DEGREES 42' 55", A DISTANCE OF 37.72 FEET (CHORD BEARS N 31 DEGREES 49' 38" W 37.72 FEET); TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF MIDLAND AVENUE; THENCE N 62 DEGREES 28' 35" E ALONG SAID RIGHT-OF-WAY A DISTANCE OF 262.30 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N 70 DEGREES 48' 52" E A DISTANCE OF 233.79 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 400.00 FEET AND A CENTRAL ANGLE OF 19 DEGREES 48' 21", A DISTANCE OF 138.27 FEET (CHORD BEARS N 80 DEGREES 43' 04" E 137.58 FEET); THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 89 DEGREES 22' 47" E A DISTANCE OF 220.22 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 04 DEGREES 05' 51" W A DISTANCE OF 89.94 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 88 DEGREES 21' 25" E A DISTANCE OF 29.12 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N 84 DEGREES 12' 24" E A DISTANCE OF 200.33 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N 13 DEGREES 23' 18" E A DISTANCE OF 18.04 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 79 DEGREES 22' 12" W A DISTANCE OF 693.85 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 15 DEGREES 25' 14" W A DISTANCE OF 81.35 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY 72 DEGREES 50' 58" E A DISTANCE OF 30.90 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 87 DEGREES 49' 17" E A DISTANCE OF 164.69 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N 47 DEGREES 19' 34" E A DISTANCE OF 37.65 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 74 DEGREES 59' 10" E A DISTANCE OF 294.83 FEET THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 08 DEGREES 06' 53" E A DISTANCE OF 62.58 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S

**LEGAL DESCRIPTION**

77 DEGREES 46' 27" E A DISTANCE OF 150.75 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N 14 DEGREES 20' 16" E A DISTANCE OF 62.19 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 79 DEGREES 08' 31" E A DISTANCE OF 369.05 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAYS 18 DEGREES 40' 13" E A DISTANCE OF 29.17 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 66 DEGREES 03' 20" A DISTANCE OF 143.01 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N 25 DEGREES 40' 28" E A DISTANCE OF 42.89 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 74 DEGREES 19' 33" A DISTANCE OF 339.00 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 76 DEGREES 23' 22" E A DISTANCE OF 559.87 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 1190.00 FEET AND A CENTRAL ANGLE OF 53 DEGREES 10' 47", A DISTANCE OF 1104.51 FEET (CHORD BEARS S 48 DEGREES 18' 54" 1065.29 FEET); THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 21 DEGREES 43' 32" E A DISTANCE OF 179.06 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 68 DEGREES 16' 28" W A DISTANCE OF 31.36 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 23 DEGREES 26' 58" E A DISTANCE OF 78.05 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N 68 DEGREES 16' 28" E A DISTANCE OF 29.01 FEET, THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S 21 DEGREES 43' 32" E A DISTANCE OF 613.97 FEET; THENCE LEAVING SAID RIGHT-OF-WAY S 62 DEGREES 49' 19" W 292.63 FEET; THENCE ALONG THE ARC OF A CURVE TO THE RIGHT HAING A RADIUS OF 760.00 FEET AND A CENTRAL ANGLE OF 24 DEGREES 24' 13", A DISTANCE OF 323.70 FEET (CHORD BEARS S 75 DEGREES 01' 26" W 321.26 FEET); THENCE S 27 DEGREES 10' 41" E 147.90 FEET; THENCE S 62 DEGREES 49' 19" W A DISTANCE OF 281.27 FEET; THENCE S 16 DEGREES 27' 24" E A DISTANCE OF 1206.11 FEET; THENCE N 89 DEGREES 15' 16" W A DISTANCE OF 3719.58 FEET; THENCE N 01 DEGREES 13' 52" E A DISTANCE OF 1360.08 FEET; THENCE N 88 DEGREES 45' 05" W A DISTANCE OF 1367.66 FEET; THENCE N 01 DEGREES 04' 56" E A DISTANCE OF 1369.90 FEET; TO THE POINT OF BEGINNING.

COUNTY OF GARFIELD  
STATE OF COLORADO



ALTA COMMITMENT

Schedule B-1

(Requirements)

Our Order No. GW243987

The following are the requirements to be complied with:

Payment to or for the account of the grantors or mortgagors of the full consideration for the estate or interest to be insured.

Proper instrument(s) creating the estate or interest to be insured must be executed and duly filed for record, to-wit:

1. A BOUNDARY SURVEY CONTAINING AN ADEQUATE LEGAL DESCRIPTION OF THE PROPERTY TO BE CONVEYED MUST BE RECEIVED BY LAND TITLE GUARANTEE COMPANY.
2. RELEASE OF DEED OF TRUST DATED JANUARY 30, 2004, FROM GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY TO THE PUBLIC TRUSTEE OF GARFIELD COUNTY FOR THE USE OF ALPINE BANK TO SECURE THE SUM OF \$250,000.00 RECORDED FEBRUARY 02, 2004, IN BOOK 1558 AT PAGE 566, UNDER RECEPTION NO. 645916.
3. PARTIAL RELEASE OF DEED OF TRUST DATED SEPTEMBER 06, 1996, FROM GLENWOOD LAND COMPANY, LLC TO THE PUBLIC TRUSTEE OF GARFIELD COUNTY FOR THE USE OF LAWRENCE MARX AND ROBERT APPEL TO SECURE THE SUM OF \$2,000,000.00 RECORDED SEPTEMBER 06, 1996, IN BOOK 991 AT PAGE 438.

AFFIDAVIT OF PRINCIPAL BALANCE OWING AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED MAY 19, 2004 IN BOOK 1589 AT PAGE 194.

SUBORDINATION AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED MAY 19, 2004 IN BOOK 1589 AT PAGE 201.

4. PARTIAL RELEASE OF DEED OF TRUST DATED MAY 07, 2004, FROM GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY TO THE PUBLIC TRUSTEE OF GARFIELD COUNTY FOR THE USE OF ALPINE BANK TO SECURE THE SUM OF \$2,000,000.00 RECORDED MAY 19, 2004, IN BOOK 1589 AT PAGE 207.
5. PARTIAL RELEASE OF DEED OF TRUST DATED OCTOBER 16, 1998, FROM GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY TO THE PUBLIC TRUSTEE OF GARFIELD COUNTY FOR THE USE OF GLENWOOD LAND COMPANY, LLC TO SECURE THE SUM OF \$2,586,940.00 RECORDED NOVEMBER 23, 1998, IN BOOK 1099 AT PAGE 608.

SUBORDINATION AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED

ALTA COMMITMENT

Schedule B-1

(Requirements)

Our Order No. GW243987

Continued:

FEBRUARY 02, 2004 IN BOOK 1558 AT PAGE 562.

SUBORDINATION AGREEMENT IN CONNECTION WITH SAID DEED OF TRUST WAS RECORDED  
MAY 19, 2004 IN BOOK 1589 AT PAGE 195.

6. WARRANTY DEED FROM GLENWOOD MEADOWS, LLC, A COLORADO LIMITED LIABILITY  
COMPANY TO ROARING FORK TRANSPORTATION AUTHORITY CONVEYING SUBJECT  
PROPERTY.

NOTE: ITEMS 1-3 OF THE STANDARD EXCEPTIONS WILL BE DELETED UPON RECEIPT OF  
AN APPROVED SURVEY. MATTERS DISCLOSED BY SAID SURVEY MAY BE ADDED TO  
SCHEDULE B-2 HEREOF.

UPON THE APPROVAL OF THE COMPANY AND THE RECEIPT OF A NOTARIZED FINAL LIEN  
AFFIDAVIT, ITEM NO. 4 OF THE STANDARD EXCEPTIONS WILL BE AMENDED AS  
FOLLOWS:

ITEM NO. 4 OF THE STANDARD EXCEPTIONS IS DELETED AS TO ANY LIENS OR FUTURE  
LIENS RESULTING FROM WORK OR MATERIAL FURNISHED AT THE REQUEST OF GLENWOOD  
MEADOWS, LLC, A COLORADO LIMITED LIABILITY COMPANY.  
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY SHALL HAVE NO LIABILITY FOR  
ANY LIENS ARISING FROM WORK OR MATERIAL FURNISHED AT THE REQUEST OF  
ROARING FORK TRANSPORTATION AUTHORITY.

NOTE: ITEM 5 OF THE STANDARD EXCEPTIONS WILL BE DELETED IF LAND TITLE  
GUARANTEE COMPANY CONDUCTS THE CLOSING OF THE CONTEMPLATED TRANSACTION(S)  
AND RECORDS THE DOCUMENTS IN CONNECTION THEREWITH.

NOTE: UPON PROOF OF PAYMENT OF 2003 TAXES, ITEM 7 UNDER SCHEDULE B-2 WILL  
BE DELETED AND ITEM 6 WILL BE AMENDED TO READ:

TAXES AND ASSESSMENTS FOR THE YEAR 2004 AND SUBSEQUENT YEARS.

ITEM 8 UNDER SCHEDULE B-2 WILL BE DELETED UPON PROOF THAT THE WATER AND  
SEWER CHARGES ARE PAID UP TO DATE.

# ALTA COMMITMENT

Schedule B-2

(Exceptions)

Our Order No. GW243987

The policy or policies to be issued will contain exceptions to the following unless the same are disposed of to the satisfaction of the Company:

1. Rights or claims of parties in possession not shown by the public records.
2. Easements, or claims of easements, not shown by the public records.
3. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, and any facts which a correct survey and inspection of the premises would disclose and which are not shown by the public records.
4. Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.
5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date the proposed insured acquires of record for value the estate or interest or mortgage thereon covered by this Commitment.
6. Taxes and assessments not yet due or payable and special assessments not yet certified to the Treasurer's office.
7. Any unpaid taxes or assessments against said land.
8. Liens for unpaid water and sewer charges, if any.
9. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED FEBRUARY 09, 1892, IN BOOK 12 AT PAGE 106.
10. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED JUNE 04, 1895, IN BOOK 12 AT PAGE 367.
11. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED OCTOBER 26, 1896, IN BOOK 12 AT PAGE 440.
12. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 268.

ALTA COMMITMENT

Schedule B-2

(Exceptions)

Our Order No. GW243987

The policy or policies to be issued will contain exceptions to the following unless the same are disposed of to the satisfaction of the Company:

13. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 269.
14. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 270.
15. RIGHT OF WAY FOR DITCHES OR CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES AS RESERVED IN UNITED STATES PATENT RECORDED JUNE 04, 1895, IN BOOK 12 AT PAGE 367.
16. RIGHT OF WAY FOR DITCHES OR CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES AS RESERVED IN UNITED STATES PATENT RECORDED OCTOBER 26, 1896, IN BOOK 12 AT PAGE 440.
17. EASEMENTS AND RIGHTS OF WAY FOR ROADS, STREETS, HIGHWAYS, DITCHES, CANALS, PIPELINES AND UTILITY LINES, INCLUDING, BUT NOT LIMITED TO:
  - A. DITCH RIGHT OF WAY AS DESCRIBED IN INSTRUMENT RECORDED DECEMBER 20, 1884 IN BOOK 10 AT PAGE 2.
  - B. RIGHT TO USE ROAD AS GRANTED TO MARY P.G. DEVEREUX IN INSTRUMENT RECORDED SEPTEMBER 16, 1905 IN BOOK 62 AT PAGE 103.
  - C. MAP AND STATMENT OF THE WULFSOHN ENLARGEMENT OF THE F.A. ATKINSON DITCH RECORDED SEPTEMBER 2, 1909 AS RECEPTION NO. 37700.
  - D. FOURTH ENLARGEMENT & EXTENSION OF THE ATKINSON CANAL RECORDED DECEMBER 8, 1950 AS RECEPTION NO. 174372.
  - E. EASEMENTS AND RIGHTS OF WAY AS GRANTED TO THE MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY IN INSTRUMENTS RECORDED JUNE 25, 1936 IN BOOK 183 AT PAGE 430.
  - F. PIPELINE RIGHT OF WAY AGREEMENT RECORDED AUGUST 3, 1951 IN BOOK 259 AT PAGE 413.
  - G. EASEMENTS AND RIGHT OF WAY FOR RED ACRES DITCH.

ALTA COMMITMENT

Schedule B-2

(Exceptions)

Our Order No. GW243987

The policy or policies to be issued will contain exceptions to the following unless the same are disposed of to the satisfaction of the Company:

- H. EASEMENT AS GRANTED TO ROCKY MOUNTAIN NATURAL GAS COMPANY, INC., IN INSTRUMENT RECORDED JANUARY 31, 1962 IN BOOK 339 AT PAGE 88.
- I. EASEMENTS AS GRANTED TO PUBLIC SERVICE COMPANY OF COLORADO IN INSTRUMENTS RECORDED OCTOBER 17, 1966 IN BOOK 379 AT PAGE 400 AND RECORDED FEBRUARY 13, 1967 IN BOOK 382 AT PAGE 181.
- J. PERMANENT EASEMENT AS GRANTED TO THE DEPARTMENT OF HIGHWAYS, STATE OF COLORADO IN INSTRUMENT RECORDED SEPTEMBER 22, 1967 IN BOOK 388 AT PAGE 101.
18. TERMS, CONDITIONS AND PROVISIONS OF CITY OF GLENWOOD SPRINGS ORDINANCE NO. 47 RECORDED JANUARY 03, 1996 IN BOOK 963 AT PAGE 131.
19. TERMS, CONDITIONS AND PROVISIONS OF CITY OF GLENWOOD SPRINGS ORDINANCE RECORDED JANUARY 03, 1996 IN BOOK 963 AT PAGE 135.
20. TERMS, CONDITIONS AND PROVISIONS OF RIGHT OF WAY ACQUISITION AGREEMENT RECORDED SEPTEMBER 26, 1994 IN BOOK 916 AT PAGE 864.
21. EASEMENTS, RIGHTS OF WAY AND OTHER MATTERS AS SHOWN ON BOUNDARY SURVEY PREPARED BY CONSTRUCTION SURVEYS, INC., DATED JUNE 28, 1996.
22. TERMS, CONDITIONS AND PROVISIONS OF STANDSTILL AGREEMENTS RECORDED SEPTEMBER 06, 1996 IN BOOK 991 AT PAGE 472 AND AT PAGE 478
23. UTILITY EASEMENT AS GRANTED TO CITY OF GLENWOOD SPRINGS, COLORADO IN INSTRUMENT RECORDED FEBRUARY 01, 2000, IN BOOK 1171 AT PAGE 191.
24. UTILITY EASEMENT AS GRANTED TO CITY OF GLENWOOD SPRINGS, COLORADO IN INSTRUMENT RECORDED AUGUST 15, 2000, IN BOOK 1201 AT PAGE 977.
25. TERMS, CONDITIONS AND PROVISIONS OF AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, PROVIDING FOR THE ANNEXATION TO THE CITY A PARCEL OF LAND LOCATED IN GARFIELD COUNTY, COLORADO, ALONG MIDLAND AVENUE AND KNOWN AS WULFSOHN RANCH (GLENWOOD MEADOWS) RECORDED DECEMBER 06, 2002 IN BOOK



ALTA COMMITMENT

Schedule B-2

(Exceptions)

Our Order No. GW243987

The policy or policies to be issued will contain exceptions to the following unless the same are disposed of to the satisfaction of the Company:

1414 AT PAGE 522.

26. TERMS, CONDITIONS AND PROVISIONS OF ANNEXATION & DEVELOPMENT AGREEMENT (PRIVATE), GLENWOOD MEADOWS, LLC ANNEXATION RECORDED DECEMBER 06, 2002 IN BOOK 1414 AT PAGE 526.
27. TERMS, CONDITIONS AND PROVISIONS OF AMENDMENT TO ANNEXATION RECORDED MAY 06, 2004 IN BOOK 1585 AT PAGE 438.

## LAND TITLE GUARANTEE COMPANY

### DISCLOSURE STATEMENTS

Note: Pursuant to CRS 10-11-122, notice is hereby given that:

- A) The subject real property may be located in a special taxing district.
- B) A Certificate of Taxes Due listing each taxing jurisdiction may be obtained from the County Treasurer's authorized agent.
- C) The information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder, or the County Assessor.

Note: Effective September 1, 1997, CRS 30-10-406 requires that all documents received for recording or filing in the clerk and recorder's office shall contain a top margin of at least one inch and a left, right and bottom margin of at least one half of an inch. The clerk and recorder may refuse to record or file any document that does not conform, except that, the requirement for the top margin shall not apply to documents using forms on which space is provided for recording or filing information at the top margin of the document.

Note: Colorado Division of Insurance Regulations 3-5-1, Paragraph C of Article VII requires that "Every title entity shall be responsible for all matters which appear of record prior to the time of recording whenever the title entity conducts the closing and is responsible for recording or filing of legal documents resulting from the transaction which was closed". Provided that Land Title Guarantee Company conducts the closing of the insured transaction and is responsible for recording the legal documents from the transaction, exception number 5 will not appear on the Owner's Title Policy and the Lenders Policy when issued.

Note: Affirmative mechanic's lien protection for the Owner may be available (typically by deletion of Exception no. 4 of Schedule B, Section 2 of the Commitment from the Owner's Policy to be issued) upon compliance with the following conditions:

- A) The land described in Schedule A of this commitment must be a single family residence which includes a condominium or townhouse unit.
- B) No labor or materials have been furnished by mechanics or material-men for purposes of construction on the land described in Schedule A of this Commitment within the past 6 months.
- C) The Company must receive an appropriate affidavit indemnifying the Company against un-filed mechanic's and material-men's liens.
- D) The Company must receive payment of the appropriate premium.
- E) If there has been construction, improvements or major repairs undertaken on the property to be purchased within six months prior to the Date of the Commitment, the requirements to obtain coverage for unrecorded liens will include: disclosure of certain construction information; financial information as to the seller, the builder and or the contractor; payment of the appropriate premium fully executed Indemnity Agreements satisfactory to the company, and, any additional requirements as may be necessary after an examination of the aforesaid information by the Company.

No coverage will be given under any circumstances for labor or material for which the insured has contracted for or agreed to pay.

Note: Pursuant to CRS 10-11-123, notice is hereby given:

This notice applies to owner's policy commitments containing a mineral severance instrument exception, or exceptions, in Schedule B, Section 2.

- A) That there is recorded evidence that a mineral estate has been severed, leased, or otherwise conveyed from the surface estate and that there is a substantial likelihood that a third party holds some or all interest in oil, gas, other minerals, or geothermal energy in the property; and
- B) That such mineral estate may include the right to enter and use the property without the surface owner's permission.

Nothing herein contained will be deemed to obligate the company to provide any of the coverages referred to herein unless the above conditions are fully satisfied.

**JOINT NOTICE OF PRIVACY POLICY**  
**OF**  
**LAND TITLE GUARANTEE COMPANY AND LAND TITLE INSURANCE CORPORATION AND**  
**OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY**

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with a nonaffiliated third party unless the institution provides you with a notice of its privacy policies and practices, such as the type of information that it collects about you and the categories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of Land Title Guarantee Company and Land Title Insurance Corporation and Old Republic National Title Insurance Company.

We may collect nonpublic personal information about you from the following sources:

- Information we receive from you such as on applications or other forms.
- Information about your transactions we secure from our files, or from our affiliates or others.
- Information we receive from a consumer reporting agency.
- Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

We may disclose any of the above information that we collect about our customers or former customers to our affiliates or to nonaffiliated third parties as permitted by law.

We also may disclose this information about our customers or former customers to the following types of nonaffiliated companies that perform marketing services on our behalf or with whom we have joint marketing agreements:

- \* Financial service providers such as companies engaged in banking, consumer finance, securities and insurance.
- \* Non-financial companies such as envelope stuffers and other fulfillment service providers.

**WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.**

We restrict access to nonpublic personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

Recorded Sept 30, 1949 at 1:45 P.M.  
 Reception No. 169931 Chas. B. Keegan, Recorder Book 245  
 Page 269

1880

# THE UNITED STATES OF AMERICA,

*Mc Series*  
 CERTIFICATE  
 No. 163 } *Whereas* Edward E. Pray, of Garfield County, Colorado

has deposited in the General Land Office of the United States a Certificate of the Register of the Land Office at Huerfano Springs, Colorado, whereby it appears that full payment has been made by the said Edward E. Pray according to the provisions of the Act of Congress of the 24th of April, 1820, entitled "An Act making further provision for the sale of the Public Lands," and the acts supplemental thereto, as the South East quarter of the South East quarter of Section five and the East half of the North East quarter and the South West quarter of the North East quarter and the South West quarter of the North East quarter of Section eight, in Township six South, of Range twenty nine West of the Sixth Principal Meridian in Colorado containing One hundred and sixty acres.

according to the Original Plat of the Survey of the said Lands returned to the General Land Office by the Surveyor General, which said tract has been purchased by the said Edward E. Pray.

Now know ye, That the United States of America in consideration of the premises and in conformity with the several Acts of Congress in such case made and provided, have given and granted, and by these presents do give and grant unto the said Edward E. Pray

and to his heirs, the said tract above described To have and to hold the same, together with all the rights, privileges, immunities, and appurtenances, of whatever nature, thereto in anywise belonging, unto the said

Edward E. Pray and to his heirs and assigns forever, subject to any vested and reserved water rights for mining, agricultural, manufacturing, or other purposes and rights to ditches and canals used in connection with such water rights as may be recognized and acknowledged by the local customs, laws, and decisions of courts and also subject to the right of the proprietor of a town or lot to extend and remove his or their claim, should the same be found to preclude or interfere the premises hereby granted, as provided by law.

In testimony whereof J. Benjamin Harrison  
 President of the United States of America, have caused these letters to be made Patent, and

## THE UNITED STATES OF AMERICA,

12/106

Certificate No. 938

To all to Whom these Presents shall come, GREETING:

Whereas, Maurice E. Morrow and Paris Meadows of Colorado  
County, Colorado  
 have deposited in the General Land Office of the United States a Certificate of the Register of the Land Office at  
Glenwood Springs, Colorado whereby it appears that full payment has been made by the said  
Maurice E. Morrow and Paris Meadows  
 according to the provisions of the Act of Congress of the 24th of April, 1820, entitled "An Act making further pro-  
 vision for the sale of the Public Lands," and the acts supplemental thereto, for the North East  
quarter of the North West quarter of Section nine in Township  
six South of Range eighty nine West of the Sixth Principal  
Meridian in Colorado containing forty acres.

according to the Official Plat of the Survey of the said Lands, returned to the General Land Office by the  
 Surveyor General, which said Tract has been purchased by the said Maurice E. Morrow and  
Paris Meadows.

Now Know Ye, That the United States of America, in consideration of the premises, and in conformity  
 with the several Acts of Congress in such case made and provided, have given and granted, and by these presents  
 do give and grant unto the said Maurice E. Morrow and Paris Meadows  
 and to their heirs, the said Tract above described: To Have and to Hold the same, together with all  
 the rights, privileges, immunities and appurtenances, of whatsoever nature, thereunto belonging, unto the said  
Maurice E. Morrow and Paris Meadows  
 and to their heirs and assigns forever; subject to any vested and accrued water rights for mining, agri-  
 cultural, manufacturing or other purposes, and rights to ditches and reservoirs used in connection with such  
 water rights as may be recognized and acknowledged by the local customs, laws and decisions of Courts, and  
 also subject to the right of the proprietor of a vein or lode to extract and remove his ore therefrom, should the  
 same be found to penetrate or intersect the premises hereby granted, as provided by law.

In Testimony Whereof, I, Benjamin Harrison President of the United States of America,  
 have caused these letters to be made patent, and the Seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the thirtieth  
 day of December, in the year of our Lord one thousand eight  
 hundred and ninety one, and of the Independence of the United  
 States the one hundred and sixteenth.

BY THE PRESIDENT: Benjamin HarrisonBy M. M. L. S. Secretary.W. P. Roberts Recorder of the General Land Office.Recorded, Vol. 44 Page 1Filed for Record the 10th day of February A. D. 1892, at 11<sup>05</sup> o'clock A. M.Paul BlountPacket Page 562 Clerk and Recorder

By

Deputy.



## The Series

Certificate of Origin

Whereas, Marion B. Mayne of Harild, Grant County, Colorado

according to the provisions of the Act of Congress of the 24th of April, 1820, entitled "An Act making further provision for the sale of the Public Lands," and the acts supplemental thereto, for lands within the boundaries

according to the Official Plat of the Survey of the said Lands, returned to the General Land Office by the Surveyor General, which said Tract has been purchased by the said \_\_\_\_\_

and to his heirs and assigns forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws and decisions of Courts, and also subject to the right of the proprietor of a vein or lode to extract and remove his ore therefrom, should the

In Testimony Whereof, I,

Given under my hand, at the City of Washington, the Twenty First  
day of Novr, in the year of our Lord one thousand eight

day of Mar, in the year of our Lord one thousand eight  
hundred and eighty four, and of the Independence of the United  
States the one hundred and eighteenth

BY THE PRESIDENT: *Grover Cleveland*

By M. McLean Secretary.

*L. J. C. Lamm* Recorder of the General Land Office.

Recorded, Vol. 5A Page 85

Filed for Record the 3 day of June A. D. 1895, at 9 o'clock A. M.

By A. I. Dickson Recorder  
Deputy.



# THE UNITED STATES OF AMERICA,

*116 Series*

Certificate No. *1426*

To all to Whom these Presents shall come, GREETING:

Whereas, *Fred. A. Atkinson of Campbell County, Texas*

has deposited in the General Land Office of the United States a Certificate of the Register of the Land Office at *Georgetown, Texas*, whereby it appears that full payment has been made by the said *Fred. A. Atkinson*

according to the provisions of the Act of Congress of the 24th of April, 1820, entitled "An Act making further provision for the sale of the Public Lands," and the acts supplemental thereto, for *the South East quarter of Section Six in Township Six South of Range Eighty nine West of the Sixth Principal Meridian in Conn.* containing *thirty eight acres and sixty hundredths of an acre*

according to the Official Plat of the Survey of the said Lands, returned to the General Land Office by the Surveyor General, which said Tract has been purchased by the said *Fred. A. Atkinson*

Now Know Ye, That the United States of America, in consideration of the premises, and in conformity with the several Acts of Congress in such case made and provided, have given and granted, and by these presents do give and grant unto the said *Fred. A. Atkinson* and to *his* heirs, the said Tract above described: To Have and to Hold the same, together with all the rights, privileges, immunities and appurtenances, of whatsoever nature, thereunto belonging, unto the said *Fred. A. Atkinson*

and to *his* heirs and assigns forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws and decisions of Courts, and also subject to the right of the proprietor of a vein or lode to extract and remove his ore therefrom, should the same be found to penetrate or intersect the premises hereby granted, as provided by law, *and there is reserved from the land hereby granted a right of way thereon for ditches, canals, reservoirs &c. for the use of the* President of the United States of America, *In Testimony Whereof, I, J. McKim*

have caused these letters to be made patent, and the Seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the *fourth* day of *October*, in the year of our Lord one thousand eight hundred and *ninety six*, and of the Independence of the United States the one hundred and *forty sixth*

BY THE PRESIDENT:

By *Wm M. Keane* Secretary.

*L. L. C. Lamar* Recorder of the General Land Office.



Recorded, Vol. *5a* Page *436*

Filed for Record the *27th* day of *October* A. D. 1896, at *12* o'clock *P.*M.

Book 245  
Page 268

Recorded Sept 30, 1949 at 1:37 P.M.  
Reception No. 169932 Chas. S. Keegan, Recorder

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
WASHINGTON, D. C.

has, deposited in the General Land Office of the United States a Certificate of the Register of the Land Office at Silverwood Springs, Colorado, whereby it appears that full payment has been made by the said

Isaiah R. Perley *Isaiah R. Perley of Garfield County, Colorado*  
the provisions of the Act of Congress of the 23rd of April, 1880, entitled "An Act relating to the sale of the Public Lands," and the acts supplemental thereto, for the North West quarter of the North East quarter and the East half of the North West quarter of section eight in Township Six South of Range eighty-ninth West of the Sixth Principal Meridian in Colorado, containing one hundred and twenty acres.

according to the Official Plat of the Survey of the said Lands, returned to the General Land Office by the Surveyor General, which said Plat has been purchased by the said Isaiah R. Perley.

Now know ye, That the United States of America, in consideration of the premises, and in conformity with the several acts of Congress in such case made and provided, have given and granted, and by these presents do give and grant unto the said Isaiah R. Perley

and to his heirs, the said Tract above described: To have and to hold the same, together with all the rights, privileges, immunities, and appurtenances, of whatever nature, thereto belonging, unto the said

Isaiah R. Perley and to his heirs and assigns forever, subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws, and decisions of courts, and also subject to the right of the proprietors of a vein or lode to extract and remove his ore therefrom, should the same be found to be a lode, or interest in the premises hereby granted, as provided by law.

In testimony whereof J. Benjamin Harrison

President of the United States of America, have caused these letters to be made Patent, and the seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the twenty-second day of November, in the year of our Lord one thousand eight hundred and ninety-five, and of the Independence of the United States the one hundred and fiftieth.

By the President: Benjamin Harrison

Ellen Macfarland, Asst. Secretary

J. M. Townsend, Recorder of the General Land Office.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

WASHINGTON, D. C. SEP. 26, 1949

I hereby certify that this photograph is a true copy of the patent record, which is in my custody in this office.

Jas. D. Homer  
Chief, Patents Section.

Book 245 Recorded Sept 30 1949 at 1:40 P.M.  
 Page 270 Reception No. 169933 Chas. S. Keegan, Recorder

# UNITED STATES OF AMERICA

DEPARTMENT OF THE INTERIOR  
 BUREAU OF LAND MANAGEMENT

*Magnus A. Peterson*

is a person in the General Land Office of the United States a Certificate of the Register of the Land Office at Greenwood Springs, Colorado, whereby it appears that full payment has been made by the said *Magnus A. Peterson*

according to the provisions of the Act of Congress of the 25th of April, 1880, entitled "An Act making further provision for the sale of the Public Lands," and the acts supplemental thereto, for the South West quarter of the South East quarter and the North West quarter of the South West quarter of the North West quarter of the 36th Principal Meridian in Colorado, containing one hundred and sixty acres

according to the Official Plat of the Survey of the said Lands, returned to the General Land Office by the Surveyor General, which said Tract has been purchased by the said *Magnus A. Peterson*

Now know ye, That the United States of America, in consideration of the premises, and in conformity with the several Acts of Congress in such case made and provided, have given and granted, and by these presents do give and grant unto the said *Magnus A. Peterson*

and to his heirs, the said Tract above described: To have and to hold the same, together with all the rights, privileges, immunities, and appurtenances, of whatever nature, thereto belonging, unto the said *Magnus A. Peterson*

and to his heirs and assigns forever, subject to any vested and actual water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws, and decisions of courts, and also subject to the right of the proprietor of a town or lake to extract and remove his ore therefrom, should the same be found to penetrate or intersect the premises hereby granted, as provided by law.

In testimony whereof *J. Benjamin Harrison* President of the United States of America, have caused this letter to be made Patent, and the seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the Second day of April, in the year of our Lord one thousand eight hundred and ninety one, and of the Independence of the United States the one hundred and fiftieth.

By the President: *Benjamin Harrison*

*Allen Macfarland Asst. Secretary*

*J. M. Townsend, Recorder of the General Land Office.*

1654047  
 8867



UNITED STATES  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF LAND MANAGEMENT

WASHINGTON, D. C. SEP. 26, 1949

I hereby certify that this photograph is a true copy of the patent record, which is in my custody in this

# To all whom these Presents may Concern:

KNOW YE, that Wm. F. Rogers, M. C. Moore and Albert H. Brown  
 of the County of Jefferson and State of Colorado, do hereby declare and publish as a Legal  
 Notice to all the world, that I have a valid right to the occupation, possession and enjoyment of all and singular  
 that ~~tract or parcel of land, not exceeding one hundred and sixty acres~~ <sup>Ditch and water right</sup>, situate, lying and being in the County  
 of Jefferson and State of Colorado, bounded and described as follows:

*Beginning at a point  
 on West or South bank of Roaring Fork River about three miles from the mouth  
 of said River and running thence 3 miles and a half or four miles in a Northerly  
 direction  
 He claims right of way for ditch two feet wide 11 inches deep and sufficient  
 water from said Roaring Fork River to fill said ditch*

together with all and singular the hereditaments and appurtenances thereto belonging or in anywise appertaining.

Witness my hand and seal this 1st day of December  
 one thousand eight hundred and eighty-four

STATE OF COLORADO, }  
 COUNTY OF \_\_\_\_\_ ss.

I, \_\_\_\_\_  
 in and for the said County, in the State aforesaid, do hereby certify that \_\_\_\_\_  
 \_\_\_\_\_ who \_\_\_\_\_ personally  
 known to me to be the person whose name \_\_\_\_\_ subscribed to the annexed declaration of occupancy, appeared  
 before me this day in person and acknowledged that \_\_\_\_\_ executed the same as \_\_\_\_\_ free and voluntary  
 act and deed for the uses and purposes therein set forth.

Witness my hand and \_\_\_\_\_ seal at \_\_\_\_\_  
 on this \_\_\_\_\_ day of \_\_\_\_\_ A. D. 18

Filed for Record the 1st day of December A. D. 1884 at \_\_\_\_\_ o'clock, P. M.



67/103

This Deed, Made this 20<sup>th</sup> day of July in the year of our Lord one thousand nine hundred and 1905, between Fred. O. Atkinson

of the County of Garfield and State of Colorado, of the first part, and Mary P. G. Demerut

of the County of Garfield and State of Colorado, of the second part, WITNESSETH, That the said part Mary P. G. Demerut of the first part, for and in consideration of the sum of One Dollar, and other valuable considerations to the said part Fred. O. Atkinson of the first part in hand paid by the said part Fred. O. Atkinson of the second part, the receipt whereof is hereby confessed and acknowledged, has remised, released, sold, conveyed and QUIT-CLAIMED, and by these presents doth remise, release, sell, convey and QUIT-CLAIM unto the said part Mary P. G. Demerut of the second part her heirs and assigns forever, all the right, title, interest, claim and demand which the said part Fred. O. Atkinson of the first part has in and to the following described real estate situate, lying and being in the County of Garfield and State of Colorado, to-wit:

Beginning at the South-east corner of Sec. 5 Township 6, S. R. 87 West of the 10th P.M., thence North on the East line of the said Section 5, 342 feet to a point, thence South 62 degrees West 335 feet to a point; thence South 28 degrees E., to the South line of said Sec. 5; thence East on said South line to the place of beginning. Said tract of land so conveyed hereby adjoining the Locke 2.74 acre tract on the North side of the track as conveyed hereby. Also beginning at a point on the East line of said Sec. 5, 650.4 feet north of the S.E. corner of said section 5; thence South 62 degrees West 339.2 feet to a point; thence North on a line parallel with the East line of said Sec. 5, to the center of the channel of the Grand River; thence South easterly along said center of channel to said East line of Section 5; thence South on said East line to the place of beginning. Said tract of land so conveyed, adjoining the Locke 2.74 acre tract on the Southeast side of said tract so conveyed hereby. Also conveying a private right of way to be used in common with the owners or owners of the lands formerly owned by Maurice E. Morrow and other adjoining lands, formerly owned by Amos. A. Rice, such private way consisting of a road, way as now laid out and used, and extending from the South line of said Section 5 Southwesterly and near the East line of the NE 1/4 of the NE 1/4 of Sec. 8, and a portion of the NE 1/4 of the NE 1/4 of said Sec. 8, and thence Southwesterly near the NE 1/4, NW 1/4 of Sec. 9, following the right of way of the Colorado Midland Railway, in part and extending to the East line of said NE 1/4, NW 1/4, all in T. 6, S. R. 87 West of the 10th P.M., the said roadway being now fenced on both sides throughout. It being understood and agreed that in case said roadway or any part thereof hereafter hereafter abandoned, all rights conveyed hereby shall revert back to and become the sole and separate property of that part, bearing this instrument. That party also grants a right of way and easement as set forth from the East line of said NE 1/4, NW 1/4 of Sec. 9, right of way and to be used for a road or for a railroad to have and to hold the same, together with all and singular the appurtenances and privileges thereto belonging or in anywise thereto appertaining, and all the estate, right, title, interest and claim whatsoever of the said part Fred. O. Atkinson of the first part, either in law or equity, to the only proper use, benefit and behoof of the said part Mary P. G. Demerut of the second part, her heirs and assigns forever.

IN WITNESS WHEREOF, The said part Fred. O. Atkinson of the first part has hereto set his hand and seal the day and year first above written.

Signed, Sealed and Delivered in Presence of

Fred. O. Atkinson

STATE OF COLORADO,

County of Garfield

I. C. W. Morrow, a Notary Public

in and for said County, in the State aforesaid, do hereby certify that Fred. O. Atkinson who is

personally known to me to be the person whose name is Fred. O. Atkinson subscribed to the above Deed, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument of writing as his free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and Notarial seal, this 20<sup>th</sup> day of July 1905.

My commission expires Jan. 27<sup>th</sup> 1908.

I. C. W. Morrow  
Notary Public

Notarial Seal

Filed for Record the 16<sup>th</sup>

day of September

A. D. 1905, at 12<sup>45</sup> o'clock P.M.

Packet Page 568

Wm. Cardwell Recorder.  
By Emily C. Ensign Deputy.

# 37700

# 0445

Map and Statement of the Wulfsohn enlargement of the F.A. Atkinson Ditch in Irrigation Division 5, Water district 38, Garfield County, Colorado. Headgate is located at a point on the south bank of the Roaring Fork River whence the SE Cor Sec 2, Range 34S, 37W, Twp 35S. The owner of this enlargement is Julius Wulfsohn of Glenwood Springs, Colo. Enlargement is for irrigating about 250 acres of land in Sec 6 and 8, in Twp 35S Range 37W 6 P M. to Sineux power for pumping, for running dynamo, and for general manufacturing purposes. Depth of Ditch as enlarged is 6' width on the bottom is 8' on top is 16'. Length is 1650'. Grade is 5' to one mile carrying capacity is 216 cfs per Sec estimated on a mean velocity of 3 ft per sec. Cost of this enlargement is \$3500. Work was commenced on the 1st day of April. A D 909 Capacity of original ditch was 626 ft per sec.

State of Colorado } SS  
County of Garfield }

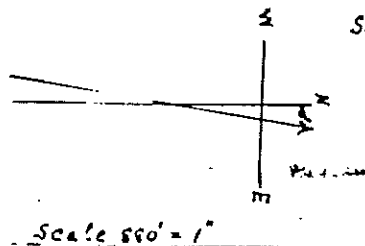
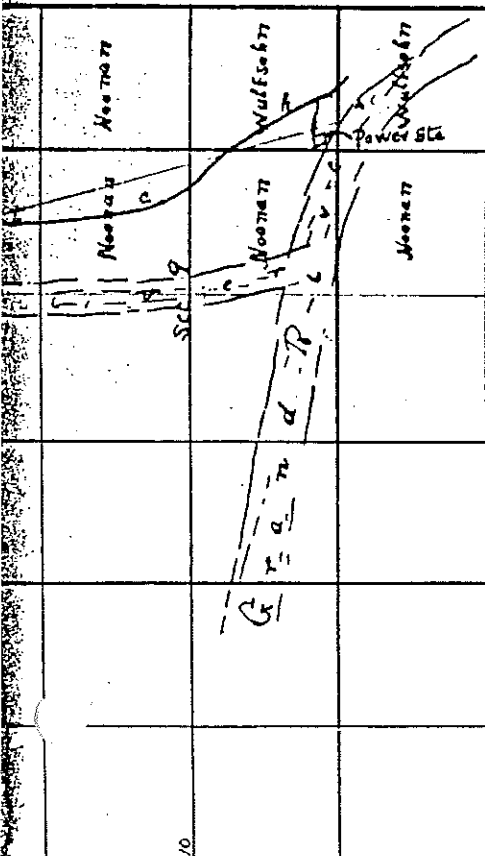
C. B. Harris being duly sworn on his oath testifies and says that he is the surveyor above said that the survey of the ditch and the map thereon was made by him and that such survey is correct and that the matter therein set forth is true to his own knowledge.

Surveyor

Subscribed and sworn to before me this 18th day of June 10, 1909

J. J. Smith County Judge  
Notary Public

My Commission Expires



State Engineers Office,  
Denver, Colorado.

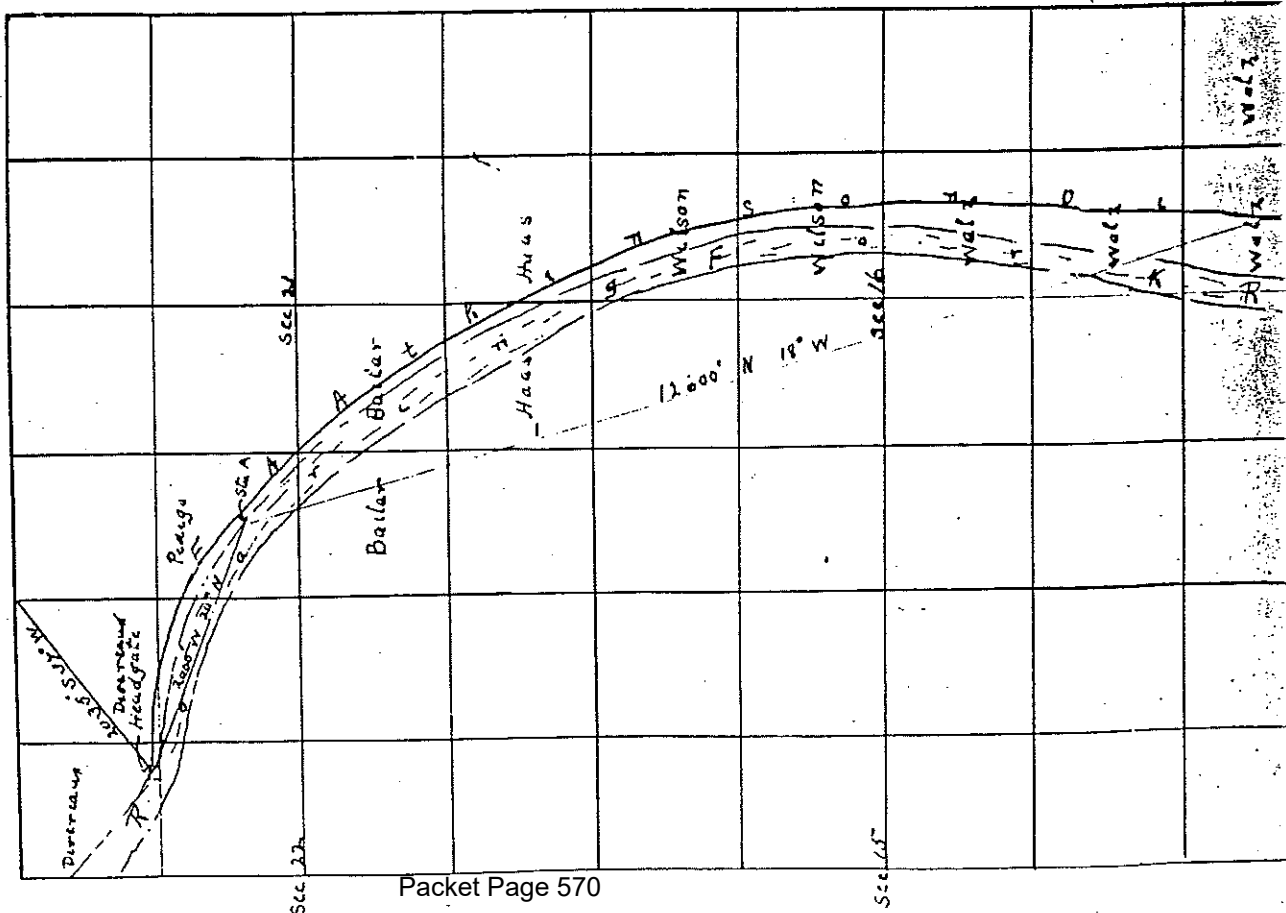
I hereby certify that this map and statement has been examined and approved by me and is a duplicate of the one filed in the office of the State Engineer on the 21st day of June 1909.

Unfiled  
File

By

State Engineer  
Deputy

149

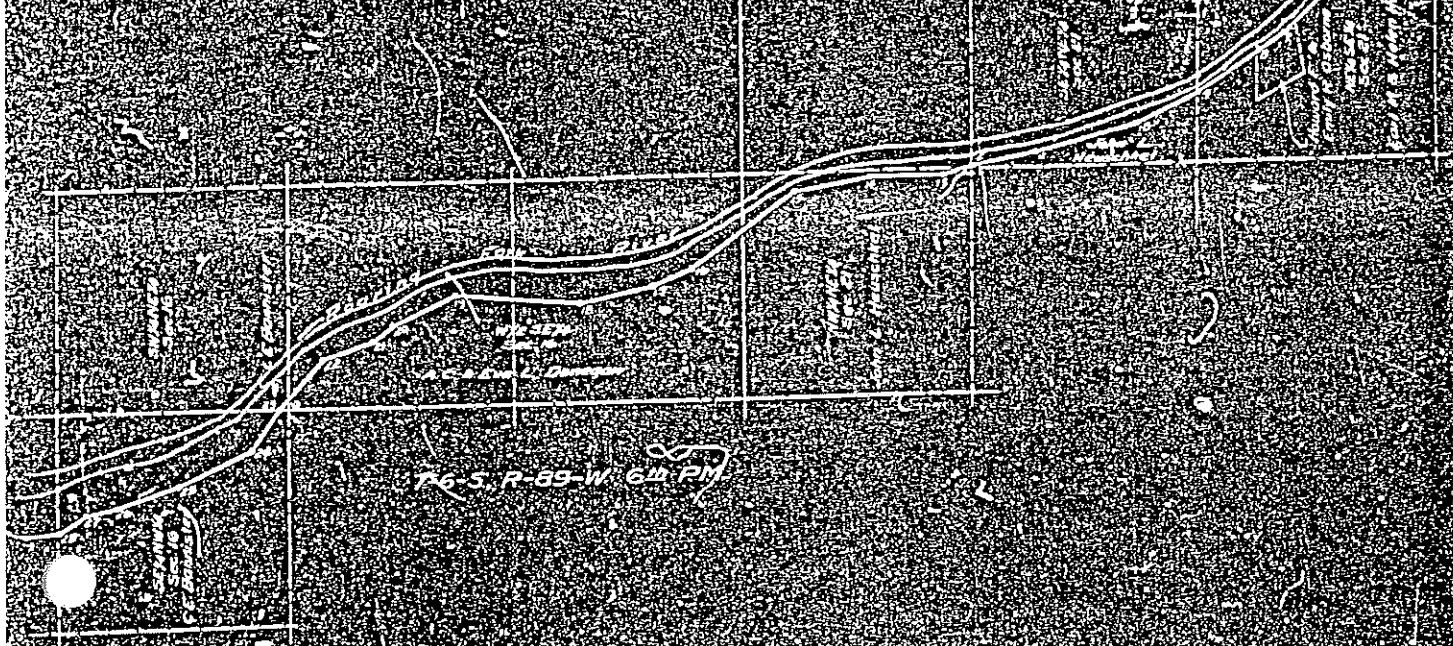


[illegible]



Map No. 5 - WATER DISTRICT NO. 38  
as defined in The Territorial  
Scale 1" = 600 ft.

100

[illegible][illegible]

| Year | Fourth Enlargement <sup>1</sup> Edman | After Fourth Enlargement <sup>1</sup> Edman |
|------|---------------------------------------|---------------------------------------------|
| 1900 | 4.0 feet of high water line.          | death 13; 2.0 feet of high water line       |
|      | 4.0 "                                 | width 7.0 "                                 |
|      | 4.0 " on the bottom.                  | 6.0 " on the bottom                         |
|      | 4.0 " for 1000 feet                   | grade 1.15 per 10000 feet                   |
|      | width 1.0 "                           | length 24776.4 feet                         |

capacity of said canal was per second of time.

Two cost of the Fourth Emergency and Division is \$10,000  
announced by Burns on the 15<sup>th</sup> day of March 1950, on the  
announced and Division.



**CITY OF COLORADO**, ss  
County of **Garfield**

Tam, Walter being duly sworn by his oath deposes and says that he has full knowledge of the facts Entertainments and Extension of Health Insurance Co., that the survey of the same was made by the said Tam, Walter and that such survey was actually made by him and that he has read the documents thereto and that the same have been read and known by him.

*[Signature]*

Surveyor

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

Subscribed and sworn to before me this 1 day of Nov. 1954  
 My commission expires February 24, 1954

Charles D. Ferguson,  
Nelson, Public

11

11-2-11

Figure 1

Accepted for Filing in the Office of the State Engineer  
On the 30th day of November 1960

[illegible]

18512

012



## RIGHT OF WAY

173/430

Correct:

Wm. Bell  
R.O.W. Agent.

Approved:

B. F. Curtis  
State Const. Engineer

Approved:

A. W. Young  
State Plant Superintendent.

\$25.00 RECEIVED OF THE MOUNTAIN STATES TELEPHONE AND TELEGRAPH CO. Twenty Five Dollars, in consideration of which I hereby grant unto said Company, its successors and assigns, the right, privilege and authority to construct, operate and maintain the lines of Telephone and Telegraph, including the necessary underground conduit, poles, cables, wires and fixtures upon, over and across the property which I own, or in which I have any interest, in the South half of the North West Quarter and the North half of the South West Quarter of Section No. Sixteen (16) Township No. Six (6) South, Range Eighty-Seven (87) West of the sixth (6th) Principal Meridian

County of Garfield and State of Colorado and upon and along the roads, streets or highways adjoining the said property, with the right to permit the attachment of the wires of any other company, and the right to trim and remove any trees along said lines so as to keep the wires cleared at least forty-eight inches, to erect and set the necessary guy and brace poles and anchors and to attach thereto the necessary guy wires.....

Said sum being received in full payment therefor.

Witness my hand and seal this 22 day of May A. D. 1936 at Carbondale, Colo.

Witnesses: Wm. Bell

C. W. Miller (SEAL)  
Land Owner

No officer or employee of this Company is authorized to procure a receipt to a voucher except upon payment of its amount, and the COMPANY hereby gives notice, that if this voucher is signed without payment being made, it is done at the SIGNER'S OWN RISK.

The Denver-Grand Junction-Salt Lake Line.

Filed for record Jun 25, 1936, at 8:42 o'clock A. M.

Walter J. Frost, Recorder

By Chas. S. Keegan, Deputy

#124352

## RIGHT OF WAY

Correct:

Wm. Bell  
R.O. W. Agent.

Approved:

B. F. Curtis State Plant Engineer  
State Const. Engineer

Approved:

A. W. Young

State Plant Superintendent

\$10.00 RECEIVED OF THE MOUNTAIN STATES TELEPHONE AND TELEGRAPH CO Ten and No/100 Dollars and other good & valuable considerations in consideration of which We hereby grant unto said Company, its successors and assigns, the right, privilege and authority to construct, operate and maintain its lines of Telephone and Telegraph, including the necessary underground conduit, poles, cables, wires and fixtures upon, over and across the property which I own, or in which We have any interest, in the South East Quarter of the South West Quarter of Section Five (5), The North East Quarter of Section Eight (8) and the South West Quarter of the North West Quarter of Section Nine (9) All in Township No. Six (6) South Range Eighty Nine (89) West of the sixth (6th) Principal Meridian County of Garfield and State of Colorado and upon and along the roads, streets or highways adjoining the said property, with the right to permit the attachment of the wires of any other company, and the right to trim and remove any trees along said lines so as to keep the wires cleared at least forty-eight inches, to erect and set the necessary guy and brace poles and anchors and to attach thereto the necessary guy wires. Provided said Telephone and Telegraph line be located, established and maintained above the fence which lies west of present cultivated land except poles numbered 7241, 7254 to 7257

Witness hand and seal this 25 day of May A. D. 1936, at Glenwood Spgs Colo.

Witnesses: Wm. Bell

The Wulfsohn Merc. Co.  
By J. Wulfsohn (SEAL)  
Sec. & Treas.  
Land owner.

No officer or employee of this Company is authorized to procure a receipt to a voucher except upon payment of its amount, and the COMPANY hereby gives notice, that if this voucher is signed without payment being made, it is done at the SIGNER'S OWN RISK.

The Denver Grand Junction Salt Lake Toll Line

Filed for Record Jun 25, 1936, at 8:44 o'clock A. M.

Walter J. Frost, Recorder.  
By Chas. S. Keegan, Deputy.



PIPELINE AGREEMENT

THIS INDENTURE, Made and entered into this 17 day of July, A. D. 1951, by and between D. E. DUNSDON, of the County of Garfield, State of Colorado, party of the first part, and C. E. BELL, of the County and State aforesaid, party of the second part, WITNESSETH:

WHEREAS, the party of the first part is the owner of a certain tract of land situate in the NE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 5, Township 6, South Range 89 West of the 6th P. M. in the County of Garfield and State of Colorado, which tract of land will for brevity be referred to hereinafter as "said premises"; and

WHEREAS, the party of the second part is desirous of securing an easement or right of way for a water pipeline for the use and benefit of certain land lying northerly of said premises;

NOW, THEREFORE, for and in consideration of the sum of One Dollar and other valuable considerations paid by said party of the second part to said party of the first part, the receipt whereof is hereby confessed and acknowledged, and of the covenants of the party of the second part hereinafter contained, party of the first part hereby grants and conveys to the party of the second part, his heirs, executors, administrators and assigns forever and in perpetuity a right of way or easement through, under, and across the said premises for the purpose of installing, maintaining and repairing a pipeline four inches in diameter, which right of way or easement is described as follows, to-wit:

A right-of-way for a water pipeline situate in the NE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 5, Township 6 South Range 89 West of the 6th Principal Meridian, the center line of which right-of-way is described as follows: Beginning at a point on the North line of the property of the party of the first part whence the South Quarter corner of Section 35, Township 5, South Range 89 West of the 6th Principal Meridian bears

There is also hereby conveyed the right of ingress and egress to and from said premises for the purpose of installing, main-  
taining and repairing said pipeline.

Each and all the terms, conditions, covenants and agreements herein contained shall extend to and become binding upon the heirs, executors, administrators and assigns of the respective parties hereto.

D. E. Davidson  
Party of the First Part

C.B. B...  
Party of the Second Part

The foregoing instrument was acknowledged before me this  
 day of July, A. D. 1951, by D. E. DUNSDON and C. B. BELL.

My Commission Expires: 10/15/53

**Notary Public**

Recorded Jan 31, 1962 at 9:10 A. M.  
 Reception No. 216409 Claus. S. Keegan, Reporter

## RIGHT OF WAY

THIS AGREEMENT, dated the 5th day of October, 1981, by and between  
UNION OIL COMPANY OF CALIFORNIA, a corporation, hereinafter termed Grantor, and ROCKY MOUNTAIN  
NATURAL GAS COMPANY, INC., hereinafter termed Grantee.

WITNESSETH:

Grantor, for and in consideration of the full and prompt performance of the acts to be performed by Grantee as herein set forth, hereby grants to Grantee, subject to termination as herein provided and under the terms, conditions and provisions hereof, the right and privilege to lay, erect, construct, maintain, operate, repair, renew, and remove, inspect and protect:

One (1) pipeline not to exceed 5 " in diameter for the transportation of fuel gas and necessary valves and valve boxes over and above the course hereafter described in the premises situated in the County of Garfield, State of Colorado to-wit:

Township 6 South, Range 89 West of the 6th P.M.

Section 5: S $\frac{1}{2}$  of S $\frac{1}{2}$   
Section 8: NE $\frac{1}{4}$  NE $\frac{1}{4}$   
Section 9: W $\frac{1}{4}$  NW $\frac{1}{4}$

The pipeline shall follow a course described as follows: Beginning at a point on the East line of the SW $\frac{1}{4}$  NW $\frac{1}{4}$  of Section 9, Twp. 6 S., Rge. 89 W., 6th P. M., which point is North 289.90' from the Southeast Corner of said SW $\frac{1}{4}$  NW $\frac{1}{4}$ ; thence N. 41°19' W. 245.6'; thence N. 43°34' W. 500.1'; thence N. 42°14' W. 1168.7'; thence N. 33°27' W. 61.7'; thence N. 25°42' W. 146.0'; thence N. 37°56' W. 266.7'; thence N. 42°19' W. 324.1'; thence N. 34°39' W. 443.7'; thence N. 40°32' W. 430.7'; thence N. 55°13' W. 515.1'; thence N. 65°17' W. 163.7'; thence N. 75°12' W. 191.7'; thence N. 70°59' W. 210.8'; thence N. 64°08' W. 717.8'; thence N. 67°31' W. 859.5'; thence N. 2°32' E. 179.2', to a point on the North line of the SE $\frac{1}{4}$  SW $\frac{1}{4}$  of Section 5, Twp. 6 S., Rge. 89 W., being a distance of 389.34 rods.

Consideration to Grantor for this agreement shall be the sum of Ten and more Dollars (\$10.00) receipt of which is hereby acknowledged.

Grantor shall not interfere with or obstruct the use of said premises by Grantee, or injure or interfere with any person or property on or about said premises.

[illegible]

In the event that the facility constructed hereunder is a pipe line, Grantee shall bury the same so that it will pass beneath previously laid pipe lines which it may cross and so that it will be at all points at least <sup>18</sup>/<sub>24</sub> inches below the surface of the ground and shall promptly and properly backfill all excavations made by or for Grantee on the premises.

Whenever, in the opinion of Grantor, the facility constructed hereunder, interferes with Grantor's use of or operations upon the premises, Grantee shall, at its own expense and risk, within sixty (60) days after written request therefor by Grantor, raise, lower or relocate and reconstruct said facility in the manner and at the place within the boundaries of said premises specified by Grantor in such request, and shall restore said premises as nearly as possible to the same state and condition as that in which they were prior to such rearrangement, relocation or reconstruction, as the case may be.

Route # 314



Grantee and its employees and agents, at any and all times when necessary, shall have free access to the facility constructed hereunder, over such reasonable route as Grantor may designate or approve, for the purpose of exercising the rights hereby granted.

The rights and privileges hereby conveyed are personal to Grantee and shall not be assigned by Grantee, in whole or in part, without the written consent of Grantor first being had. No written consent by Grantor hereunder shall be deemed a waiver by Grantor of any of the provisions hereof, except to the extent of such consent.

It is further understood and agreed that this agreement and the rights and privileges herein given Grantee shall terminate in the event that Grantee shall fail for a period of one year to maintain and operate the facility constructed hereunder.

~~Grantee hereby agrees to indemnify and hold Grantor harmless from and against all claims and demands of third parties arising out of or in connection with the operations of the facility constructed hereunder.~~

In the event of the termination of this agreement by Grantor, Grantor shall, at his own expense and risk, remove all property placed by or for Grantee upon said land, and restore said premises as nearly as possible to the same state and condition as existing prior to any construction hereunder; but, if it should fail so to do within sixty (60) days after such termination, Grantor may sue at the risk of Grantee and all cost and expense of such removal and the restoration of said premises, as aforesaid, together with interest thereon at the rate of ten per cent per annum, shall be paid by Grantee upon demand; and in case of a suit to enforce or collect the same, Grantee agrees to pay Grantor in addition a reasonable attorney's fee to be fixed and allowed by the court.

Upon the termination of the rights hereby granted, Grantee shall execute and deliver to Grantor, within thirty (30) days after service of a written demand therefor, a good and sufficient quitclaim deed to the rights hereby granted. Should Grantee fail or refuse to deliver to Grantor a quitclaim deed as aforesaid, a written notice by Grantor reciting the failure or refusal of Grantee to execute and deliver said quitclaim deed, as herein provided, and terminating said grant, shall, after ten (10) days from the date of recitation of said notice, be conclusive evidence against Grantee and all persons claiming under Grantee of the termination of said grant.

Grantee shall and will pay, before the same become delinquent, all charges, taxes, rates and assessments upon or against said facility and any other property or improvements placed by or for Grantee upon said premises; but Grantor may, at all times after any delinquency, pay and discharge all of such delinquent charges, taxes, rates and assessments; after reasonable verification thereof, and all such payments so made by Grantor with interest thereon at the rate of ten per cent per annum from date of payment will be paid by Grantee upon demand. The amount of such payments and interest shall be a charge and lien against all property placed by or for Grantee on said premises and in case of a suit, after such demand, to enforce or collect the same, Grantee agrees to pay Grantor in addition thereon a reasonable attorney's fee to be fixed and allowed by the court.

Grantee hereby releases and discharges Grantor from all claims and demands by Grantee for loss of or damage to Grantee's property, and agrees to indemnify Grantor against and save Grantor harmless from all costs and expenses, including attorney's fees, and all liability and claims and demands of others, for loss of or damage to property, or injury to or death of persons, which may result directly or indirectly from the granting, use or termination of, or operations under, this agreement. Grantee agrees to pay Grantor in full and promptly upon demand for any and all loss of or damage to Grantor's property caused by Grantee, by or growing out of any operations of Grantee hereunder or in connection herewith.

Any notice provided herein to be given by either party hereto to the other may be served by depositing in the United States Post Office, postage prepaid, a sealed envelope containing a copy of such notice and addressed to said other party at its principal place of business, and the same shall be sufficient service of such notice.

Grantee hereby recognizes Grantor's title and interest in and to the land over which the aforesaid right of way is granted, and agrees never to assail or resist Grantor's title or interest therein.

Except as otherwise provided herein, the terms and conditions of this agreement shall inure to the benefit of, and be binding upon, the successors and assigns of the parties hereto.

It is understood and agreed that the privileges herein given are subordinate to and subject to all valid and existing licenses, leases, grants, exceptions and reservations affecting said premises.

IN WITNESS WHEREOF the said parties hereto have caused this agreement to be executed in duplicate by their proper officers, who are thereunto duly authorized.

UNION OIL COMPANY OF CALIFORNIA

By H. J. Sanders Vice President

By W. H. Jones Assistant Secretary

ROCKY MOUNTAIN NATURAL GAS COMPANY INC.

By John Fawcett

By \_\_\_\_\_

STATE OF CALIFORNIA

COUNTY OF San Diego

The foregoing instrument was acknowledged before me this 1 day of January, 1961, by H. J. SANDERS, Vice President, and E. W. CAIRNS, Assistant Secretary of UNION OIL COMPANY OF CALIFORNIA, a California Corporation, who are known to me to be such officers; and who acknowledged to me that they executed said instrument by the authority of said Corporation, and as the act and deed of said Corporation.

My Commission expires 1-16-63

HELEN R. MILLER

WITNESS MY HAND AND OFFICIAL SEAL

Notary Public

NOTARY PUBLIC

In and for the County of San Diego, State of California

Book 379 Page 400 (Recorded at 3:50 P.M. October 17, 1966)  
Reception No. 275187 Chas. S. Keegan Recorder  
**EASEMENT** 6387

THIS INSTRUMENT, made this 12th day of October, 1966, in the year of our Lord one thousand nine hundred and sixty-six, between  
**UNION OIL COMPANY OF CALIFORNIA** a California corporation

of the County of Los Angeles, and State of California, grantor  
and **PUBLIC SERVICE COMPANY OF COLORADO**, a corporation duly organized and existing under and by virtue of the laws of the State of Colorado, grantee.

WITNESSETH that the said grantor, for and in consideration of the sum of  
Ten Dollars (\$10.00) and other valuable consideration

to the said grantee, has paid by the said grantee the receipt whereof is hereby confessed and acknowledged, has granted, conveyed, sold and conveyed and by these presents does grant, bargain, sell, convey and confirm unto the said Public Service Company of Colorado, its successors and assigns forever, an easement for the construction, reconstruction, operation and maintenance of conductors and conduits for the transmission of electricity, together with the necessary poles, towers, crossarms, cables, wires, guywires, supports and other fixtures and devices used or useful in the operation of electric transmission lines through or over and across the following described lands, to-wit:

A parcel of land in the S-34 of Section 5 and the SE-SE of Section 6, all in Township 6 South, Range 80 West, of the 6th Principal Meridian, County of Garfield, State of Colorado, said parcel being more particularly described as follows: Beginning at a point in the east line of the SE-4 of said Section 6, distant N. 29°15'30" E., along said line 1050.6 feet from the southeast corner of said Section 6; thence N. 83°39' E., 529.2 feet to a point; thence N. 86°31' E., 200.3 feet to a point; thence N. 83°39' E., 236.8 feet to a point; thence N. 84°33'30" E., 195.3 feet to a point; thence N. 88°11'30" E., 155.3 feet to a point; thence S. 81°15' E., 190.6 feet to a point; thence S. 80°55' E., 290.4 feet to a point; thence S. 78°25' E., 194.8 feet to a point; thence S. 15°26' W., 30.0 feet to a point; thence N. 80°18'10" W., 672.2 feet to a point; thence S. 84°26'10" W., 1779.3 feet to a point; thence S. 85°32'40" W., 1818.1 feet to a point; thence N. 2°07'30" E., 30.0 feet to a point; thence N. 86°21' E., 36.1 feet to a point; thence N. 83°39' E., 677.1 feet to a point; thence S. 82°19' E., 103.1 feet to a point; thence N. 83°39' E., 470.8 feet, more or less, to the point of beginning.

It is understood and agreed by and between the parties hereto that all poles to be installed and constructed on said easement by the grantee shall be located at a distance of not to exceed 7.5 feet southerly of the southerly right-of-way line of the D & R-G.W.R.R. across said premises.

Together with the right to ingress and egress over said premises and to remove objects or structures therefrom, and also to survey, construct, reconstruct, maintain, operate, control and use said lines and facilities.

The grantor reserves the right to cultivate and use said premises for any purpose consistent with the rights and privileges above granted and which will not interfere with or endanger the grantee's facilities thereon or the use thereof or any of the rights herein granted. Such reservation by the grantor shall not include the right to erect or place any structures or objects, including signs or drill or operate any wells on, upon, above or over the easement herein granted. In case the permanent abandonment of said easement, all right, privilege and interest herein granted shall end, cease and determine.

The work of installing, maintaining and reconstructing its facilities shall be done with care and all damage to the premises caused thereby shall be paid for or repaired at the expense of the grantee.

The provisions of this easement shall be binding upon and shall inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto.

Signed and delivered this 12th day of October, A.D. 1966.

In the Presence of

ATTEST:

*[Signature]*  
Assistant Secretary

UNION OIL COMPANY OF CALIFORNIA

By: *[Signature]*  
Vice President

STATE OF COLORADO

COUNTY OF

The foregoing instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_

1966, by \_\_\_\_\_

Witness my hand and official seal.

My commission expires \_\_\_\_\_

Notary Public



ASSIGNMENT

FOURTH

UNITED SERVICE COMPANY  
OF COLORADO  
UNITED, COLORADO

17100 S. 160th Ave.

Combs, B. Chaffin

THIS INSTRUMENT WAS  
FILED FOR RECORD IN THE  
OFFICE OF THE CLERK OF THE  
COUNTY OF COLORADO

ON SEP 12 1967

AT 10:00 AM

IN THE CITY OF DENVER

BY THE CLERK OF THE COUNTY

OF COLORADO

ATTEST

NOTARY PUBLIC

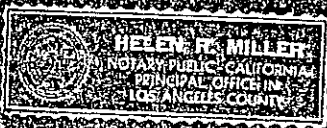
STATE OF COLORADO

CLERK OF THE COUNTY

STATE OF COLORADO

STATE OF CALIFORNIA

COUNTY OF LOS ANGELES



On September 11, 1967  
before me the undersigned a Notary Public in and for said State, personally appeared  
Shirley B. Miller known to me to be the  
Vice President and Shirley B. Miller known to me  
to be the Assistant Secretary of United Service Company of  
California  
The Corporation that executed the within instrument known to me to be the persons who  
executed the within instrument on behalf of the Corporation herein named and acknowledged  
to me that such Corporation executed the within instrument pursuant to its by laws or a  
resolution of its board of directors.  
WITNESS my hand and official seal.

Helen R. Miller

My Commission Expires September 16, 1967

NAME (TYPED OR PRINTED)  
Notary Public in and for said State

RENEWAL NOTICE - Copy: Print & Sign: Notarize Page 225-Rev 3-64

My commission expires

STATE OF COLORADO

County of

The foregoing instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_

by \_\_\_\_\_

\_\_\_\_\_ President and \_\_\_\_\_ Secretary of \_\_\_\_\_

Witness my hand and official seal

My commission expires

Notary Public

RECEIVED OF PUBLIC SERVICE COMPANY OF COLORADO

Whereas the undersigned of which [Name] hereby grant and said Company, its successors and assigns the right, privilege and authority to construct, operate and maintain its electric transmission and/or distribution line, with all poles, cross-arms, cables, wires, guys, support fixtures and devices, used or useful in the operation of said line through and along and across said line, may be hereafter constructed line through, over and across the

6 South Range 93 West of the 6 Township  
Garfield State of Colorado, the approximate center line of said right of way is more particularly described as follows:  
Beginning at a point on the Western boundary of said Lot 5 about 962 ft. North of its Southern boundary. Thence N 65 deg. 59' E 80 ft. Thence South 89 deg. 42' E 1180 ft. to the Eastern boundary of said Lot 5.

Together with the right to enter upon said premises, survey, construct, maintain, operate, control and use said transmission line and to remove objects interfering therewith, and the right to permit the attachment of wires of any other Company. The undersigned reserves the right to cultivate, use and occupy said premises for any purpose consistent with the rights and privileges above granted, which will not interfere with or hinder any of the purposes, poles, thereon or use thereof. In case of the permanent abandonment of said right of way, all rights, title and interest herein granted shall cease and determine. The work of installing and erecting power transmission or distribution line shall be done with care and all damage to the premises caused thereby shall be repaired at the expense of the Company. This grant is subject to existing mineral leases covering any part of the above described land.

Witness my hand and seal this 12th day of July, A.D. 1967.  
[Signature]  
[Name]  
(Principal Secretary)  
WITNESSES: [Signature] Public Secretary of [Signature]  
(SEAL)  
(SEAL)  
(SEAL)  
(SEAL)  
(SEAL)  
(Land Owner)

RECEIVED OF PUBLIC SERVICE COMPANY OF COLORADO

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Together with the right to enter upon said premises, survey, construct, maintain, operate, control and use said transmission line and to remove objects interfering therewith, and the right to permit the attachment of wires of any other Company. The undersigned reserves the right to cultivate, use and occupy said premises for any purpose consistent with the rights and privileges above granted, which will not interfere with or hinder any of the purposes, poles, thereon or use thereof. In case of the permanent abandonment of said right of way, all rights, title and interest herein granted shall cease and determine. The work of installing and erecting power transmission or distribution line shall be done with care and all damage to the premises caused thereby shall be repaired at the expense of the Company. This grant is subject to existing mineral leases covering any part of the above described land.

Witness my hand and seal this 12th day of July, A.D. 1967.  
[Signature]  
[Name]  
(Principal Secretary)  
WITNESSES: [Signature] Public Secretary of [Signature]  
(SEAL)  
(SEAL)  
(SEAL)  
(SEAL)  
(SEAL)  
(Land Owner)



Recorded at 10:06 A.M. Sept. 22, 1967 Book 388  
Reception No. 239010 Chas. S. Keegan, Page 101  
Recorder. 63812.1 3

PROJECT NO. 1 70-1(8)113 Section 1  
Glasgow Springs-West  
Parcel No.'s E-29A, E-29B, E-29C  
and E-29D

PERMANENT EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that UNION OIL COMPANY OF CALIFORNIA, a California Corporation, of the County of Los Angeles and State of California, hereinafter called the "grantor", for and in consideration of the sum of ONE DOLLAR (\$1.00), and other valuable consideration in hand paid by the DEPARTMENT OF HIGHWAYS, STATE OF COLORADO, hereinafter called the "Department", receipt of which is hereby acknowledged, has given and granted and by these presents does hereby give and grant unto the said Department, a PERPETUAL EASEMENT on, along, over and across the following described premises, to-wit:

A tract or parcel of land No. E-29A of the Department of Highways, State of Colorado, Project No. 1 70-1(8)113 Section 1 containing 1.338 acres, more or less, in the NW of the NW of Section 9 and NE of the NE of Section 8, Township 6 South, Range 89 West, of the Sixth Principal Meridian, in Garfield County, Colorado, said tract or parcel being more particularly described as follows:

Beginning at a point on the west line of Section 9, T. 6 S., R. 89 W., from which the NW corner of Section 9 bears N. 1° 34' 30" E., a distance of 636.6 feet;

1. Thence S. 1° 34' 30" W., along the west line of Section 9 a distance of 95.9 feet;
2. Thence S. 19° 50' E., a distance of 185.7 feet;
3. Thence S. 21° 31' 30" E., a distance of 75.0 feet;
4. Thence S. 68° 28' 30" W., a distance of 50.0 feet;
5. Thence S. 21° 31' 30" E., a distance of 50.0 feet;
6. Thence N. 68° 28' 30" E., a distance of 50.0 feet;
7. Thence S. 21° 31' 30" E., a distance of 115.0 feet;
8. Thence along the arc of a curve to the left having a radius of 1,342.4 feet, a distance of 869.0 feet (the chord of this arc bears S. 40° 38' 30" E., a distance of 857.6 feet);
9. Thence S. 56° 57' 30" E., a distance of 129.1 feet;
10. Thence N. 28° 26' E., a distance of 40.0 feet;
11. Thence along the arc of a curve to the right having a radius of 1,507.4 feet, a distance of 975.2 feet (the chord of this arc bears N. 43° 02' W., a distance of 958.3 feet);
12. Thence N. 21° 31' W., a distance of 237.0 feet;
13. Thence N. 19° 50' W., a distance of 275.0 feet, more or less, to the point of beginning.

The above described portion of Parcel No. E-29A contains 1.232 acres, more or less.

ALSO

Beginning at a point on the east line of Section 8, T. 6 S., R. 89 W., from which the NE corner of Section 8 bears N. 1° 34' 30" E., a distance of 636.6 feet;

- Continued -



Book 388  
Page 102

PROJECT NO. 1 70-1(8)113 Section 1  
Glenwood Springs-West  
Parcel No.'s E-29A, E-29B, E-29C  
and E-29D  
PAGE TWO - Permanent Easement

Parcel No. E-29A (Continued)

1. Thence N. 19° 50' W., a distance of 84.7 feet;
2. Thence S. 78° 10' W., a distance of 35.0 feet;
3. Thence S. 19° 50' E., a distance of 174.2 feet to the east line of Section 8;
4. Thence N. 1° 34' 30" E. along the east line of Section 8 a distance of 95.9 feet, more or less, to the point of beginning.

The above described portion of Parcel No. E-29A contains 0.104 acres, more or less.

The above described parcel contains a total of 1.338 acres, more or less.

ALSO

A tract or parcel of land No. E-29B of the Department of Highways, State of Colorado, Project No. 1 70-1(8)113 Section 1 containing 0.069 acres, more or less, in the NW¼ of the NW¼ of Section 9, Township 6 South, Range 89 West of the Sixth Principal Meridian, in Garfield County, Colorado, said tract or parcel being more particularly described as follows:

Beginning at a point from which the NW corner of Section 9, T.6 S., R. 89 W., bears N. 33° 32' W., a distance of 391.6 feet;

1. Thence N. 70° 10' E., a distance of 60.0 feet;
2. Thence N. 19° 50' W., a distance of 30.0 feet;
3. Thence S. 70° 10' W., a distance of 60.0 feet;
4. Thence S. 19° 50' E., a distance of 30.0 feet, more or less, to the point of beginning.

The above described parcel contains 0.069 acres, more or less.

ALSO

A tract or parcel of land No. E-29C of the Department of Highways, State of Colorado, Project No. 1 70-1(8)113 Section 1 containing 4.190 acres, more or less, in the SE¼ of the SW¼ of Section 5, Township 6 South, Range 89 West, of the Sixth Principal Meridian, in Garfield County, Colorado, said tract or parcel being more particularly described as follows:

Beginning at a point from which the SE corner of Section 5, T.6 S., R. 89 W., bears S. 69° 46' E., a distance of 3,231.9 feet;

1. Thence S. 15° 26' W., a distance of 345.0 feet;
2. Thence S. 74° 34' E., a distance of 500.0 feet;
3. Thence N. 15° 26' E., a distance of 345.0 feet;
4. Thence N. 74° 34' W., a distance of 500.0 feet, more or less, to the point of beginning.

The above described parcel contains 4.190 acres, more or less.

- Continued -

Book 388 Page 103

PROJECT NO. 1 70-1(8)113 Section 1  
Glenwood Springs-West  
Parcel No.'s E-294, E-295, E-29C  
and E-29D

PAGE THREE - Permanent Easement

Also

A tract or parcel of land No. E-29D of the Department of Highways,  
State of Colorado, Project No. 1 70-1(8)113 Section 1 containing  
0.117 acres, more or less, in the SE $\frac{1}{4}$  of the SW $\frac{1}{4}$  of Section 5  
Township 6 South, Range 89 West, of the Sixth Principal Meridian,  
in Carfield County, Colorado, said tract or parcel being more  
particularly described as follows:

Beginning at a point from which the SE corner of Section 5, T.6 S.,  
R. 89 W., bears S. 66° 05' E., a distance of 3,256.2 feet;

1. Thence S. 74° 34' E., a distance of 30.0 feet;
2. Thence N. 15° 26' E., a distance of 108.4 feet, to  
the north line of the SE $\frac{1}{4}$  of the SW $\frac{1}{4}$  of Section 5;
3. Thence N. 88° 24' 30" W., along the north line of  
the SE $\frac{1}{4}$  of the SW $\frac{1}{4}$  a distance of 51.5 feet;
4. Thence S. 15° 26' W., a distance of 96.1 feet, more  
or less, to the point of beginning.

The above described parcel contains 0.117 acres, more or less.

for the purpose of:

Subject to the following terms and conditions:

And the Grantor hereby covenants and agrees with the Department that it has  
good title to the aforescribed premises; that it has good and lawful right  
to grant this easement; that it will warrant and defend the title and quiet  
possession thereof against the lawful claims of all persons whomsoever.

has  
IN WITNESS WHEREOF, Grantor/ hereunto set its hand and seal this 9th day  
of March A.D., 1967.

AFTER RECORDING PLEASE MAIL TO:  
The Department of Highways of the State of Colorado  
Highway Office Building  
4201 East Arkansas Avenue  
Denver 22, Colorado

ATTENTION: Right of Way Section

UNION OIL COMPANY OF CALIFORNIA, a California  
Corporation, County of Los Angeles

*[Signature]*  
President  
By *[Signature]* Secretary

STATE OF California  
COUNTY OF Los Angeles

The foregoing instrument was acknowledged before me this 9th day of

March A.D., 1967 by UNION OIL COMPANY OF CALIFORNIA, a  
California Corporation of the County of Los Angeles, State of California,

By K. C. Vaughan Vice Pres. & E. W. Savina Asst. Secy.

Witness my hand and official seal.

My commission expires 7-16-67

*[Signature: Helen R. Miller]*  
Notary Public



ORDINANCE NO. 47

Series of 1995

**AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS,  
COLORADO, PROVIDING FOR THE ANNEXATION TO THE  
CITY OF GLENWOOD SPRINGS, COLORADO, OF THAT  
TERRITORY DESCRIBED IN THIS ORDINANCE, LYING  
OUTSIDE OF BUT ADJACENT TO THE CITY OF GLENWOOD  
SPRINGS AND IN THE COUNTY OF GARFIELD, COLORADO.  
(WULFSOHN WEST PARCEL).**

WHEREAS, on or before August 18, 1995, one hundred percent (100%) of the landowners of the territory included in the area described in Exhibit "A" attached hereto and made a part hereof, exclusive of public streets and alleys, filed a Petition with the Clerk of the City of Glenwood Springs, Colorado, requesting that the City Council of the City of Glenwood Springs, Colorado, commence proceedings to annex to the City of Glenwood Springs, Colorado, the territory described in Exhibit "A" hereof; and

WHEREAS, the City Council of the City of Glenwood Springs, Colorado, commenced proceedings to annex the territory described in Exhibit "A" hereof to the City of Glenwood Springs, Colorado, and held a public hearing thereon on October 19, 1995, for the purpose of determining whether the territory described in Exhibit "A" met the applicable requirements of the Colorado Municipal Annexation Act of 1965 and was eligible for annexation; and

WHEREAS, the City Council, by Resolution No. 95-21, found and concluded, based upon the findings and conclusions more particularly set forth in said Resolution, that the territory described in Exhibit "A" hereof met the applicable requirements of the Colorado Municipal Annexation Act of 1965 and resolved to annex said territory to the said City of Glenwood springs, Colorado, by ordinance.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS, COLORADO ORDAINS:

Section 1.

The territory described in Exhibit A hereby is annexed to and made a part of the City of Glenwood Springs, Colorado

Section 2.

In accordance with C.R.S. 31-12-113, the City Clerk is hereby directed to:

- A File one (1) copy of the annexation map with the original of the annexation ordinance in her office

- B. File for recording two (2) certified copies of the annexation ordinance and map of the area annexed containing a legal description of such area with the Garfield County Clerk and Recorder.

INTRODUCED, READ ON FIRST READING, PASSED AND ORDERED  
PUBLISHED IN FULL THIS 16<sup>th</sup> DAY OF NOVEMBER, 1995

CITY OF GLENWOOD SPRINGS, COLORADO

Marc Adler  
Marc Adler, Mayor

ATTEST

Robin S. Clemons  
Robin S. Clemons, City Clerk

INTRODUCED, READ ON SECOND READING, ORDERED PUBLISHED BY  
TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND  
PUBLICATION THIS 2<sup>nd</sup> DAY OF DECEMBER, 1995.

CITY OF GLENWOOD SPRINGS, COLORADO

Marc Adler  
Marc Adler, Mayor

ATTEST

Robin S. Clemons  
Robin S. Clemons, City Clerk

MULFSON WEST LEGAL DESCRIPTION

A parcel of land situated in Sections 5 and 6, Township 6 South, Range 89 West of the 6th Principal Meridian, County of Garfield, State of Colorado, said parcel being more particularly described as follows:

Beginning at a concrete Right-of-Way monument found on the Southerly Right-of-Way of the Denver and Rio Grande Western Railroad whence the Stone found in place and properly marked for the Southwest corner of said Section 5 bears S 23°29'57" W 1196.71 feet;

Thence along said Southerly Right-of-Way the following (3) courses: thence S 83°38'11" W 901.40 feet; thence N 82°19'49" W 103.10 feet; thence S 83°38'11" W 7.05 feet leaving said Southerly Right-of-Way; thence along the Northerly Right-of-Way of the Midland Ave. Right-of-Way Acquisition the following (8) courses: thence S 42°36'53" E 17.15 feet; thence along a curve to the left having a radius of 710.00 feet and an arc length of 677.30 feet, the chord of which bears S 69°56'35" E 651.91 feet. thence N 82°43'44" E 80.93 feet; thence along the arc of a curve to the left having a radius of 500.00 feet and an arc length of 194.98 feet, the chord of which bears N 71°33'27" E 193.75 feet; thence N 62°23'10" E 185.42 feet; thence N 56°38'55" E 230.74 feet; thence N 75°17'22" E 201.74 feet; thence N 06°21'46" W 19.87 feet leaving said Northerly Right-of-Way; thence along said Southerly Right-of-Way the following (3) courses: thence S 83°38'11" W 132.79 feet; thence S 86°30'11" W 200.30 feet; thence S 83°38'11" W 98.60 feet to the point of beginning, containing 5.75 acres more or less.

EXHIBIT A



Series of 1995

**AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS,  
COLORADO, ZONING LAND RECENTLY ANNEXED TO  
THE CITY OF GLENWOOD SPRINGS (WULFSOHN  
ANNEXATION).**

WHEREAS, by Ordinance No. 47, Series of 1995, the City Council annexed to the City of Glenwood Springs, Colorado, the land described in Exhibit "A" attached hereto and incorporated herein by this reference; and

WHEREAS, after a public hearing on September 27, 1995, the Planning and Zoning Commission recommended that the subject property be zoned in the C-1 District; and

WHEREAS, after a second public hearing conducted by the City Council on October 19, 1995, the City Council affirmed the recommendation of the Planning and Zoning Commission and approved C-1 zoning for the subject property; and

WHEREAS, the City Council makes the following express findings:

- A Zoning of the subject property in the C-1 District is consistent with City Goals, policies and plans and is compatible with adjacent zoning designations and uses; and
- B The C-1 District is consistent with annexation policy.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ORDAINS:

**Section 1.**

The property described in Exhibit "A", attached hereto and incorporated herein by this reference, is hereby zoned and included in the C-1 District. The official zoning map of the City is hereby amended to reflect the inclusion of the subject property in said District.

**Section 2.**

Any and all subdivision and development approvals heretofore granted by the City Council affecting the subject property are hereby ratified as being consistent with the zoning approval granted by the City Council on October 19, 1995. The execution of necessary agreements and permits consistent with any such approvals is hereby authorized. Nothing contained herein shall supersede Municipal Code requirements for issuing or exercising any Development Permit heretofore approved.

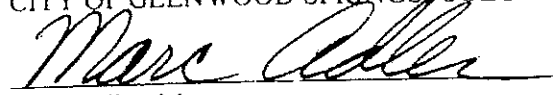
*City of Glenwood Springs  
806 Cooper Ave., 65 008/601*

Section 3.

The City Clerk is hereby directed to file a certified copy of this Ordinance for recordation with the Garfield County Clerk and Recorder.

INTRODUCED, READ ON FIRST READING, PASSED AND ORDERED PUBLISHED  
IN FULL THIS 16<sup>th</sup> DAY OF NOVEMBER, 1994<sup>5</sup>

CITY OF GLENWOOD SPRINGS, COLORADO

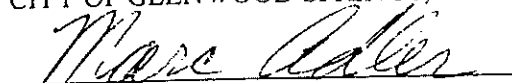
  
Marc Adler, Mayor

ATTEST:

  
Robin S. Clemons, City Clerk

INTRODUCED, READ ON SECOND READING, ORDERED PUBLISHED BY TITLE  
ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND  
PUBLICATION THIS 2<sup>th</sup> DAY OF DECEMBER, 1994<sup>5</sup>

CITY OF GLENWOOD SPRINGS, COLORADO

  
Marc Adler, Mayor

ATTEST:

  
Robin S. Clemons, City Clerk

WULFSOHN WEST LEGAL DESCRIPTION

A parcel of land situated in Sections 5 and 6, Township 6 South, Range 89 West of the 6th Principal Meridian, County of Garfield, State of Colorado, said parcel being more particularly described as follows:

Beginning at a concrete Right-of-Way monument found on the Southerly Right-of-Way of the Denver and Rio Grande Western Railroad whence the Stone found in place and properly marked for the Southwest corner of said Section 5 bears S 23°29'57" W 1196.71 feet;

Thence along said Southerly Right-of-Way the following (3) courses: thence S 83°38'11" W 901.40 feet; thence N 82°19'49" W 103.10 feet; thence S 83°38'11" W 7.05 feet leaving said Southerly Right-of-Way; thence along the Northerly Right-of-Way of the Midland Ave. Right-of-Way Acquisition the following (8) courses: thence S 42°36'53" E 17.15 feet; thence along a curve to the left having a radius of 710.00 feet and an arc length of 677.30 feet, the chord of which bears S 69°56'35" E 651.91 feet. thence N 82°43'44" E 80.93 feet; thence along the arc of a curve to the left having a radius of 500.00 feet and an arc length of 194.98 feet, the chord of which bears N 71°33'27" E 193.75 feet; thence N 60°23'10" E 185.42 feet; thence N 56°38'55" E 230.74 feet; thence N 75°17'22" E 201.74 feet; thence N 06°21'46" W 19.87 feet leaving said Northerly Right-of-Way; thence along said Southerly Right-of-Way the following (3) courses: thence S 83°38'11" W 132.79 feet; thence S 86°30'11" W 200.30 feet; thence S 83°38'11" W 98.60 feet to the point of beginning, containing 5.75 acres more or less.

EXHIBIT A

page 4 is unreadable!

# MIDLAND AVENUE RIGHT-OF-WAY ACQUISITION AGREEMENT

THIS AGREEMENT is made and entered into as of September 1, 1994, by and between UNION OIL COMPANY OF CALIFORNIA, a California corporation (hereinafter "Unocal"), and the CITY OF GLENWOOD SPRINGS, a Colorado home-rule municipality (hereinafter "City");

## WITNESSETH:

WHEREAS, Unocal is the owner of certain real property located in Garfield County, Colorado, commonly known as the Wulfsohn Ranch (hereinafter "Wulfsohn Ranch"); and

WHEREAS, Unocal is the owner of various water rights decreed to the Atkinson Canal, the headgate for which is generally located as described in the decree entered September 7, 1976, in Case No. W-2910 (Water Division No. 5); and

WHEREAS, the Atkinson Canal begins at a point south of the 27th Street bridge in the City of Glenwood Springs, extends northwesterly and generally parallel to the Roaring Fork River and Midland Avenue, then crosses the Wulfsohn Ranch; and

WHEREAS, the Atkinson Canal is used to provide irrigation water to irrigated portions of the Wulfsohn Ranch; and

WHEREAS, the City desires and intends to extend the existing Midland Avenue within the City of Glenwood Springs to the northwest from its current terminus, located south of the Wulfsohn Ranch, across the Wulfsohn Ranch, to a new bridge to be constructed across the Colorado River near the existing Interstate 70 exit for West Glenwood Springs (hereinafter the "Midland Extension Project"); and

WHEREAS, on January 13, 1994, and again on July 19, 1994, the City pursuant to C.R.S. §38-1-121 provided Unocal with formal notice of the City's intent to acquire that portion of the Wulfsohn Ranch which is needed to construct the Midland Extension Project; and

WHEREAS, as permitted under C.R.S. § 38-1-121, the City and Unocal have prepared appraisals and engaged in negotiations concerning the City's intended condemnation of a portion of the Wulfsohn Ranch; and

WHEREAS, Unocal has, under threat of condemnation by the City, agreed to convey to the City title to that portion of the Wulfsohn Ranch described in this Agreement, subject to the terms and conditions of this Agreement; and

WHEREAS, the parties desire to set forth herein their agreement concerning the conveyance from Unocal to the City of that portion of the Wulfsohn Ranch required for the Midland Extension Project, the compensation for such taking, and related matters.



NOW, THEREFORE, for and in consideration of the above recitals, the mutual covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Unocal and the City agree as follows:

1. Taking. Conveyance of Midland Extension Right-of-Way. Under threat of condemnation, and in order to allow for the completion of the Midland Extension Project, Unocal shall, at closing, convey by warranty deed to the City that portion of the Wulfsohn Ranch described on Exhibit A, attached hereto and incorporated herein by this reference. The deed form shall be a Bradford Form No. 40B (Rev. 5-84), warranty deed from a corporation. Unocal shall reserve from this conveyance an easement thirty feet (30') in width for maintenance, operation, repair, and replacement of the Atkinson Canal, with such easement lying fifteen feet (15') on either side of centerline of the Atkinson Canal. Such conveyance shall be subject to easements, reservations, restrictions, and rights-of-way of record, existing and in place. The property conveyed shall hereinafter be referred to as the "Midland Extension Right-of-Way Parcel." The City shall obtain at its sole expense a title insurance commitment and title insurance policy for the Midland Extension Right-of-Way Parcel. Unocal shall be under no obligation whatsoever to cure or otherwise address any title exception or other adverse condition of title. The City agrees and acknowledges that Unocal's warranty of title shall be limited solely to those matters insured under the title insurance policy obtained by the City, and that the amount recoverable for any claim or matter arising with regard to said warranty shall be limited to insured amount as stated on the title insurance policy. Until the construction of the boundary line fence as provided in Paragraph 11, below, the City hereby licenses Unocal to use, at Unocal's sole risk, the Midland Extension Right-of-Way Parcel.

2. Compensation. At closing, the City shall pay to Unocal the following amounts as just compensation for the Midland Extension Right-of-Way Parcel, damages to the remainder of the Wulfsohn Ranch, and damages to Unocal's water rights historically used to irrigate portions of the Wulfsohn Ranch:

| <u>Item of Taking or Damage</u>          | <u>Compensation</u> |
|------------------------------------------|---------------------|
| A. Midland Extension Right-of-Way Parcel | \$40,330.00         |
| B. Damage to remainder (2-acre parcel)   | 2,500.00            |
| C. Damage to remainder (water rights)    | 34,000.00           |
| D. Temporary Construction Easement       | 250.00              |
| TOTAL                                    | \$77,080.00         |

3. Closing. Closing of the above-referenced transaction shall occur within ten (10) days of the execution of this Agreement. The City shall pay all costs of closing, except that real property taxes shall be prorated to the day of closing based upon the most recent mill levy and

meet recent assessment and shall be determined by the ratio the Midland Extension Right-of-Way Parcel bears to the Wulfsohn Ranch.

4. Water Rights. Nothing in this Agreement shall require or be construed as a conveyance by Unocal of any water rights decreed to the Atkinson Canal or otherwise appurtenant to the Wulfsohn Ranch. The City expressly acknowledges that Unocal shall retain title to any and all water rights appurtenant to the Midland Extension Right-of-Way Parcel conveyed to the City. In any water court proceeding Unocal undertakes involving the water rights appurtenant to the Midland Extension Right-of-Way Parcel, the City shall not file a statement of opposition alleging that Unocal has abandoned such water rights, nor shall the City intervene or otherwise participate in the case upon such basis.

5. Midland Extension Plans and Specifications. If and when the City proceeds to construct the Midland Extension Project, the City shall, at its sole expense and at no expense to Unocal except as expressly provided for herein, undertake and complete all road installation, road surfacing, grading, drainage improvements, fencing, culverting, and other work for the Midland Extension Project in accordance with (A) the plans entitled "City of Glenwood Springs, Alternate Route," prepared by Schmueser Gordon Meyer, Inc., bearing Job No. 92029, consisting of 12 sheets, and dated January 1, 1993 (Sheets 1-3), October 12, 1992 (Sheets 4-9 and 12) and December 4, 1992 (Sheets 10-12) (hereinafter "Midland Extension Project Plans"); (B) the April 1994 technical specifications prepared by Schmueser Gordon Meyer, Inc. for materials for canal culverting previously approved by Unocal in that certain agreement between the parties dated April 19, 1994, (hereinafter "Midland Extension Project Specifications"), and (C) the Engineering Standards attached hereto as Exhibit B and incorporated herein by this reference (hereinafter "Engineering Standards"). The Midland Extension Project Plans, the Midland Extension Project Specifications, and the Engineering Standards are hereinafter referred to individually, or collectively as the Midland Extension Project Plans and Specifications. Unocal hereby approves the Midland Extension Project Plans and Specifications, subject to the provisions of Paragraph 10, below.

6. Purpose. One of the purposes of this Agreement is to ensure that Unocal's interests, including specifically Unocal's ownership and use of the Atkinson Canal and Unocal's ownership of the remaining portions of the Wulfsohn Ranch, are not adversely affected by the City's Midland Extension Project. For purposes of this Agreement, all references to "Midland Extension Project" refers solely and specifically to those components of the City's project, as shown on the Midland Project Plans and Specifications, which affect the Atkinson Canal structure or easement, or drainage which affects the Atkinson Canal structure or easement, or any interest in the Wulfsohn Ranch retained by Unocal.

7. Project Control. The City shall be solely responsible for the construction, installation, and completion of the Midland Extension Project and appurtenant facilities and, except as expressly provided for herein to the contrary, all costs associated therewith. The City is authorized to commence the Midland Extension Project, as contemplated in the Midland Extension Project Plans and Specifications, upon execution of this Agreement by all parties

hereto; provided, however, no construction shall interfere with Unocal's ability to use the Atkinson Canal for irrigation purposes during the irrigation season, or otherwise interfere with Unocal's activities upon or operation of that portion of the Wulfsohn Ranch retained by Unocal.

8. Access to Wulfsohn Ranch. The City shall instruct its agents, contractors, subcontractors, material suppliers and employees to keep gates closed and take all steps consistent with sound construction site management to prevent third parties from accessing the Wulfsohn Ranch, and shall cooperate with Unocal to prevent third parties from accessing the Wulfsohn Ranch. Except for the temporary construction easement referred to in Paragraph 19, below, the City shall not without Unocal's prior written consent, enter upon or allow its agents, contractors, subcontractors, material suppliers or employees to enter upon those portions of the Wulfsohn Ranch owned by Unocal.

9. Non-Interference with Agricultural Operations. The City agrees, for itself and its agents, employees, contractors, subcontractors and material suppliers, to (A) keep construction activity for the Midland Extension Project within the Midland Extension Right-of-Way Parcel and the temporary construction easement referred to in Paragraph 19, below; (B) ensure that Unocal, its tenants and lessees will have access to the Wulfsohn Ranch during work on the Midland Extension Project, and (C) ensure that the Atkinson Canal will carry irrigation water and will be operational for use by Unocal, its tenants and lessees for irrigation and other purposes during the irrigation season (April 15-October 31) and, for that purpose, the City shall not undertake canal culverting or other work on the Atkinson Canal during the irrigation season.

10. Modifications of Midland Extension Project Plans and Specifications. In the event the City desires to subsequently modify the Midland Extension Project, as defined in Paragraph 6, above, from the Midland Extension Project Plans and Specifications, the City shall forward the proposed modifications to Unocal, which shall approve or disapprove the proposed modifications, and Unocal's approval shall not be unreasonably withheld. In the event Unocal disapproves the proposed modifications, the City Engineer (and/or consulting engineers) shall meet with Unocal representatives and Unocal's engineer to formulate alternatives necessary to implement this Agreement and complete the Midland Extension Project. The parties agree that time is of the essence to secure agreement upon any modifications to the Midland Extension Project Plans and Specifications. Notwithstanding the foregoing, in the event the City and Unocal cannot agree, the City shall construct the Midland Extension Project pursuant to the original Midland Extension Project Plans and Specifications.

11. Fencing. Prior to commencement of any work on the Midland Extension Project, but in no event later than April 15, 1995, the City shall at its expense install fencing along the Midland Extension Right-of-Way Parcel boundary as provided in this Paragraph. In those areas not subject to the temporary construction easement as provided in Paragraph 19, below, the City shall install permanent fencing, which shall be four-strand barbed wire. In those areas subject to temporary easements as provided in Paragraph 19, below, the City shall install temporary fencing which shall be replaced with permanent fencing (four-strand barbed wire) at the time the project is completed or at the time the temporary easement is no longer required, whichever first

occurs. After completion of the Midland Extension Project, the City at its expense shall maintain, repair and replace all fencing along the Midland Extension Right-of-Way Parcel, unless damage is caused by ranching operations on the Wulfsohn Ranch.

12. Inspections. Unocal shall have the right to undertake such inspections of the Midland Extension Project as Unocal deems appropriate at any time prior to, during, or after completion of the same; provided, however, that such inspections shall be limited to Unocal's interest in the Midland Extension Project as set forth in Paragraph 6, above. Further, the City agrees to provide Unocal's engineer seven (7) days' written notice prior to the commencement of any work on or within the Atkinson Canal easement reserved by Unocal. The City shall not cover or bury any portion of culvert installed for the Atkinson Canal until it has provided Unocal and Unocal's engineer forty-eight (48) hours' notice and the opportunity to inspect and approve the facilities, and until it has received notice from Unocal that the City may proceed to cover or bury the facilities. If Unocal fails to respond within 48 hours to a notice the City provides prior to burying or covering facilities, the City shall be entitled to treat such non-response as approval and proceed to cover or bury the culverts or facilities.

13. Nonconforming Work. In the event the City completes or constructs the Midland Extension Project, as defined in Paragraph 6, above, contrary in a material manner to the Midland Extension Project Plans and Specifications and any modifications approved pursuant to Paragraph 10, above, or fails to complete the Midland Extension Project, which installation or failure adversely affects Unocal's interest as determined by Unocal in its reasonable discretion, the City, at its sole expense, shall upon demand by Unocal undertake all work required to bring the Midland Extension Project into conformance with the Midland Extension Project Plans and Specifications. Unocal shall be entitled to enforce this right by an action at law or equity, including an action for specific performance.

14. Midland Extension Access Points.

A. Farm Access. The City shall provide to Unocal three access points for use by Unocal in connection with its farming and ranching operations on the Wulfsohn Ranch. For this purpose, the City shall install two farm access points on the south boundary and one farm access point on the north boundary (which shall provide for access to the approximately 5-acre outparcel created by the conveyance of the Midland Extension Right-of-Way Parcel and located north of such right-of-way in the westerly end of the Wulfsohn Ranch). Such farm access points shall be gates located in the fence constructed pursuant to Paragraph 11, above, which gates shall be a minimum of 16 feet in width. The City hereby grants Unocal the right to utilize such access points pending development of the Wulfsohn Ranch property and the conversion of or replacement of such access points to or with the development access points as provided for in subparagraph B, below. Prior to closing, Unocal shall specify the location of the access points, which locations shall be mutually agreed upon by the parties, and which agreement shall not be unreasonably withheld. The gates shall have or be of

equal or better specifications than those for the existing 16-foot (16') gate at the entrance to the Wulfsohn Ranch.

- B. Development Access Points. The City agrees to provide to Unocal three access points from the Midland Extension Right-of-Way Parcel onto the Wulfsohn Ranch property at such time as Unocal desires to develop the Wulfsohn Ranch property. One access point shall be for the north outparcel created on the west end of the Wulfsohn Ranch as a result of the Midland Extension Project. Two access points shall be for the developable portions of the Wulfsohn Ranch property located south of the Midland Extension Right-of-Way Parcel. The actual location and design of such access points shall be subject to engineering considerations and approval by the City, which approval shall not be unreasonably withheld. Such accesses shall be constructed to agreed upon specifications at Unocal's sole expense; provided, however, the City shall not, as a condition of granting such accesses, require Unocal to pay the City any consideration whatsoever.
- C. Existing Access to 2-Acre Outparcel. Unocal shall be entitled to maintain its existing farm access to the 2-acre outparcel created by conveyance of the Midland Extension Right-of-Way Parcel and located in the southeastern portion of the Wulfsohn Ranch; provided, however, that such access point may be relocated as or converted to a development access by mutual consent of Unocal and the City, and consistent with sound engineering practices.

15. Farm Access Road and Pump Relocation. As a result of the City's acquisition of the Midland Extension Right-of-Way Parcel and the construction of the Midland Extension Project, a new farm access road will be required from the existing Midland Avenue on the south end of the Wulfsohn Ranch. In addition, Unocal will be required to relocate its existing pump station in the Atkinson Canal, also located generally in the southeastern portion of the Wulfsohn Ranch. Unocal shall undertake the construction of a new farm access road and the relocation of the pump station. The City agrees to pay Unocal the sum of \$12,000.00 at closing as total compensation for such costs. The City also agrees to extend electrical service to the relocated pump station at the City's sole cost. Unocal agrees to convey to the City a non-exclusive easement, not to exceed fifteen feet (15') in width, for installation, maintenance, operation, repair and replacement of the electric facilities. The easement shall be adjacent to the new farm access road or in location mutually agreed upon by the parties.

16. Atkinson Canal Crossings; Utility Sleeves. The City shall as part of the Midland Extension Project, and at its expense, install those crossing and culverts for the Wulfsohn Ranch portion of Atkinson Canal as shown on the Midland Extension Project Plans and Specifications. Unocal shall have the right to purchase sleeves for utility installation and other utility purposes. The City shall install the utility sleeves at Unocal's expense as part of the Midland Extension Project. The location of and specifications for any utility sleeves shall be mutually agreed upon by Unocal and the City, and the City's approval shall not be unreasonably withheld. The City further agrees that, subject to engineering considerations to ensure that the use of the Midland



Extension Right-of-Way is not interfered with for road and access purposes. Unocal shall be entitled to install underground utilities within the Midland Extension Right-of-Way, subject to the City's line extension policy in effect at the time of installation.

17. Completion; Conveyance of Unocal Facilities. Upon completion of the Midland Extension Project, the City Engineer shall furnish Unocal with a reproducible copy of the as-built drawings for all portions of the Midland Extension Project, together with written certification that the Atkinson Canal crossings, culverts and appurtenant facilities, and utility sleeves, were completed in substantial conformance with the Midland Extension Project Plans and Specifications, and any approved modifications and change orders. Upon such receipt, Unocal shall then provide the City written notification of its acceptance of the Atkinson Canal crossings, culverts, and appurtenant facilities, which date shall be known as the Acceptance Date. Within thirty (30) days of the Acceptance Date, the City shall execute a bill of sale conveying to Unocal, free and clear of all liens and encumbrances, the Atkinson Canal culverts and other facilities which the parties mutually agree shall be conveyed to Unocal. The City shall also provide Unocal with lien waivers for all property conveyed from all contractors, subcontractors, and material suppliers. Once conveyed to Unocal, subject to the warranty provisions of Paragraph 18, below, Unocal shall be solely responsible for operation, maintenance, repair, and replacement of Atkinson Canal culverts and appurtenant facilities.

18. Warranty. The City shall warrant all facilities which are conveyed to Unocal pursuant to this Agreement for a period of one (1) year from the Acceptance date. Specifically, but not by way of limitation, the City shall warrant that any and all facilities conveyed to Unocal shall be free of any defects in materials or workmanship for a period of one (1) year.

19. Temporary Construction Easement. Unocal hereby grants to the City a temporary construction easement (shoofly construction easement), more particularly described on Exhibit C, attached hereto and incorporated herein by this reference, not to exceed a total 0.1 acres, upon the Wulfsohn Ranch for the sole purpose of the Midland Extension Project. The City shall use these temporary easements only as necessary, as determined pursuant to the engineering and construction requirements for the Midland Extension and installation of appurtenant facilities. All temporary construction easements shall terminate upon completion of the Midland Extension or on December 31, 1996, whichever first occurs.

20. Drainage and Tailwater. Unocal shall have the right to continue irrigation of the retained portions of the Wulfsohn Ranch. The Midland Extension Project shall include adequate facilities and/or provisions for disposal of tailwater. To the extent the Midland Extension Project creates any alteration of historical drainage patterns which result in disputes with or claims by downgradient drainage recipients, the City hereby acknowledges that it shall at its expense be solely responsible for resolving such disputes or claims, and that it shall indemnify Unocal as provided in Paragraph 23, below.

21. Gas Line Relocation. In the event Rocky Mountain Natural Gas undertakes to relocate its existing natural gas line located on the Wulfsohn Ranch, the City agrees to allow

Rocky Mountain Natural Gas to relocate such gas line within the Midland Extension Right-of-Way, provided such line does not interfere with the Midland Extension Right-of-Way.

22. Scope. This Agreement applies only to the City's Midland Avenue Extension Project upon Unocal's Wulfsohn Ranch. The terms hereof shall not extend to, nor shall they be construed in any manner to extend to or be a precedential effect, with regard to any other improvements to any other portion of the Atkinson Canal or other property interests of Unocal. The parties expressly agree the compensation paid pursuant to this Agreement shall be of no precedential or evidentiary value in any future eminent domain proceeding between the parties.

23. Indemnity. To the extent permitted by law, the City shall indemnify and hold Unocal, its parent, subsidiary, and/or affiliate companies and the respective directors, officers, agents, and employees thereof, free and harmless from and against any and all liabilities, suits, claims, actions, proceedings, judgments, decrees, settlements, demands, and causes of action of all kinds, including but not limited to claims of damages to or losses of property of Unocal or others, injury, illness, or death, attorneys' fees and costs which arise from or in any manner relate to:

- A. Work performed, facilities installed, or materials provided by the City, its contractors, subcontractors, materialmen, or others in connection with the City's work on or installation of the Midland Extension Project and appurtenant facilities.
- B. Damages of any type claimed by any landowner, tenant, or other person located downstream or downgradient of the Wulfsohn Ranch or Atkinson Canal which arise from or relate to the City's work on or installation of the Midland Extension and appurtenant facilities.
- C. Damages of any type claimed by any landowner, tenant, or other person located downstream of the Atkinson Canal or otherwise which are caused by the City's work on or installation of the Midland Extension Project.
- D. The City's use of the Wulfsohn Ranch or any activity done or permitted by the City.
- E. Any breach by the City of its obligations under this Agreement.
- F. Any act or omission of the City, its agents, contractors, employees, or invitees taken pursuant to this Agreement or upon the Wulfsohn Ranch

The City shall be solely responsible to defend any such action, proceeding, or claim for which Unocal may be entitled to indemnification, and Unocal hereby agrees to fully cooperate with the City in the defense or settlement, as the case may be, of such action, proceeding, or claim, but Unocal reserves the right to participate in the defense of any such action, proceeding,

or claim at its own expense. The City shall give written notice to Unocal within ten (10) days after the City's actual knowledge of any matter giving rise to the obligation contained in this Paragraph. No insurance requirements shall be construed to limit this indemnity, which shall be effective to the maximum extent permitted by applicable law. As between Unocal and the City, the City hereby expressly waives any defenses of governmental immunity as provided in C.R.S. §24-10-101 et seq., as necessary to effectuate this indemnity; except, however, that the City expressly reserves all rights to assert governmental immunity with regard to any claims of third parties against the City.

24. Attorneys' Fees. The City shall pay Unocal its reasonable attorneys' fees incurred in the negotiation, execution, and implementation of this Agreement in the amount of approximately \$11,000. Otherwise, each party shall bear its own attorneys' fees. However, in the event litigation is necessary to enforce the rights of the parties to this Agreement, as between themselves, the prevailing party in such litigation shall be entitled to reasonable attorneys' fees and costs of suit actually incurred.

25. Engineering and Consulting Fees. The City shall pay directly all of Unocal's engineering, consulting, surveying, and inspection costs and fees for the negotiation, execution, and implementation of this Agreement ("Engineering and Consulting Fees"). These Engineering and Consulting Fees shall specifically include, but not be limited to, costs and fees for review of plans, change orders, and contract documents; field work, inspections, and drafting. The parties agree that Unocal's Engineering and Consulting Fees incurred to date are approximately \$2,750. The Engineering and Consulting Fees Unocal anticipates incurring in the future are approximately \$3,000 and shall not, so long as the City complies with the terms of this Agreement, exceed \$5,000. Unocal shall submit to the City for its review, prior to payment, copies of all bills for Engineering and Consulting Fees.

26. Complete Agreement; Amendment. This Agreement constitutes the entire and complete agreement between the parties, and any modification or amendment hereto shall be evidenced by a writing signed by the parties.

27. Binding Effect; Survival. This Agreement shall be binding upon and inure to the benefit of the parties, their successors, grantees, and assigns. Each term and condition of this Agreement shall survive the closing on the Midland Extension Right-of-Way Parcel.

28. Authority. Each person executing this Agreement represents and warrants that he has been duly authorized by the party which he purports to represent to execute this Agreement, and has authority to bind said party to the terms and conditions of this Agreement.

29. Governing Law. This Agreement shall be construed under the laws of the State of Colorado.

30. No Waiver. No provision of this Agreement may be waived except by an agreement in writing signed by the waiving party. A waiver of any term or provision shall not

be construed as a waiver of any other term or provision.

31. Headings. The paragraph headings in this Agreement shall not be used in the construction or interpretation hereof, as they have no substantive effect and are for convenience only.

32. Severability. If any part or section of this Agreement shall be found void or invalid by a court of competent jurisdiction, such finding shall not affect any remaining part or section, and said remaining parts or sections shall continue in full force and effect. The parties shall renegotiate in good faith any matter addressed by a part or section that is found void or invalid.

33. Notice. All notices required under this Agreement shall be in writing and shall be hand delivered or sent by registered or certified mail, return receipt requested, postage prepaid, to the addresses of the parties herein set forth. All notices so given shall be considered effective seventy-two (72) hours after deposit postage paid in the United States Mail with the proper address as set forth below. Either party by notice so given may change the address to which future notices shall be sent.

Notice to: Unocal Real Estate Division  
c/o Gary Parks  
4289 County Road 215  
Parachute, CO 81635

With copy to: Union Oil Company of California  
1201 West Fifth Street  
P. O. Box 7600  
Los Angeles, CA 90051

With copy to: Loyal E. Leavenworth, Esq.  
Leavenworth & Caloia, P.C.  
P. O. Drawer 2030  
Glenwood Springs, CO 81602

Notice to: City of Glenwood Springs  
attn: City Manager  
attn: City Attorney  
806 Cooper Avenue  
Glenwood Springs, CO 81601

34. Signatures; Counterparts. Unocal and the City agree that signatures obtained by facsimile transmission shall be sufficient and binding for purposes of this Agreement, and that original signatures shall be forwarded to each party. This Agreement may be executed in multiple original counterparts, each of which shall constitute an original but all of which shall

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constitute one and the same document.

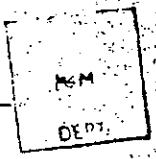
IN WITNESS WHEREOF, the parties have executed this Midland Avenue Extension Agreement in duplicate originals on the day and year first written above.

UNION OIL COMPANY OF CALIFORNIA

By

*R. R. Jewison*

Name: R. R. JEWISON, GENERAL MANAGER  
Title: REAL ESTATE DEVELOPMENT



ATTEST:

*J. A. Neal*  
J. A. NEAL, ASSISTANT SECRETARY

CITY OF GLENWOOD SPRINGS

By

*Robert J. Zancilla*

Robert J. Zancilla, Mayor

ATTEST:

*Robert S. Brown*  
City Clerk



0916-875

Legal Description:

A parcel of land situated in Sections 5, 6, 8, and 9, Township 6 South, Range 89 West of the Sixth Principal Meridian, County of Garfield, State of Colorado, said parcel being more particularly described as follows:

Beginning at a point on the Southerly Right-of-Way of the Denver and Rio Grande Western Railroad whence the Southwest corner of said Section 5 bears South 35 degrees 52 minutes 14 seconds East (S 35°52'14" E), a distance of 1220.84 feet; thence

North 83 degrees 39 minutes 00 seconds East (N 83°39'00" E), along said Right-of-Way a distance of 189.97 feet; thence leaving said Right-of-Way

South 42 degrees 36 minutes 07 seconds East (S 42°36'07" E), a distance of 17.15 feet; thence

along a curve to the left having a radius of 710.00 feet, arc length of 677.30 feet, delta angle of 54 degrees 39 minutes 24 seconds (54°39'24"), a chord bearing of South 69 degrees 53 minutes 49 seconds East (S 69°53'49" E), and a chord length of 651.91 feet; thence

North 82 degrees 44 minutes 30 seconds East (N 82°44'30" E), a distance of 80.93 feet; thence

along a curve to the left having a radius of 500.00 feet, arc length of 194.98 feet, delta angle of 22 degrees 20 minutes 35 seconds (22°20'35"), a chord bearing of North 71 degrees 34 minutes 13 seconds East (N 71°34'13" E), and a chord length of 193.75 feet; thence

North 60 degrees 23 minutes 56 seconds East (N 60°23'56" E), a distance of 185.42 feet; thence

North 56 degrees 39 minutes 41 seconds East (N 56°39'41" E), a distance of 230.74 feet; thence

North 75 degrees 18 minutes 08 seconds East (N 75°18'08" E), a distance of 201.74 feet; thence

North 06 degrees 21 minutes 00 seconds West (N 06°21'00" W), a distance of 20.00 feet to a point on said Southerly Right-of-Way of said Denver and Rio Grande Western Railroad; thence along said Right-of-Way the following eighteen (18) courses:

North 83 degrees 39 minutes 00 seconds East (N 83°39'00" E), a distance of 103.88 feet; thence

North 84 degrees 33 minutes 30 seconds East (N 84°33'30" E), a distance of 195.3 feet; thence

along a curve to the right having a radius of 2181.8 feet, arc length of 155.4 feet, delta angle of 04 degrees 04 minutes 45 seconds (04°04'45"), a chord bearing of North 83 degrees 11 minutes 30 seconds East (N 83°11'30" E), and a chord length of 155.3 feet; thence

South 81 degrees 15 minutes 00 seconds East (S 81°15'00" E), a distance of 190.6 feet; thence

along a curve to the right having a radius of 2161.8 feet, arc length of 290.6 feet, delta angle of 07 degrees 42 minutes 09 seconds (07°42'09"), a chord bearing of

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South 80 degrees 55 minutes 00 seconds East (S 80°55'00" E), and a chord length of 290.4 feet; thence

South 78 degrees 25 minutes 00 seconds East (S 78°25'00" E), a distance of 194.2 feet; thence

South 77 degrees 33 minutes 00 seconds East (S 77°33'00" E), a distance of 192.2 feet; thence

South 74 degrees 34 minutes 00 seconds East (S 74°34'00" E), a distance of 900.0 feet; thence

South 77 degrees 25 minutes 30 seconds East (S 77°25'30" E), a distance of 200.3 feet; thence

South 74 degrees 34 minutes 00 seconds East (S 74°34'00" E), a distance of 977.1 feet; thence

South 75 degrees 29 minutes 00 seconds East (S 75°29'00" E), a distance of 223.6 feet; thence

along a curve to the right having a radius of 1342.4 feet, arc length of 1063.7 feet, delta angle of 45 degrees 24 minutes 00 seconds (45°24'00"), a chord bearing of South 47 degrees 11 minutes 47 seconds East (S 47°11'47" E), and a chord length of 1036.1 feet; thence

South 21 degrees 28 minutes 30 seconds East (S 21°28'30" E), a distance of 223.7 feet; thence

South 19 degrees 50 minutes 00 seconds East (S 19°50'00" E), a distance of 125.9 feet; thence

South 28 degrees 22 minutes 00 seconds East (S 28°22'00" E), a distance of 101.1 feet; thence

South 19 degrees 50 minutes 00 seconds East (S 19°50'00" E), a distance of 361.9 feet; thence

South 21 degrees 31 minutes 00 seconds East (S 21°31'00" E), a distance of 237.0 feet; thence

along a curve to the left having a radius of 1507.4 feet, arc length of 526.55 feet, delta angle of 20 degrees 00 minutes 50 seconds (20°00'50"), a chord bearing of South 34 degrees 30 minutes 23 seconds East (S 34°30'23" E), and a chord length of 523.87 feet; thence leaving said Southerly Right-of-Way

South 54 degrees 54 minutes 14 seconds West (S 54°54'14" W), a distance of 20.00 feet; thence

South 35 degrees 05 minutes 46 seconds East (S 35°05'46" E), a distance of 163.12 feet; thence

along a curve to the left having a radius of 950.00 feet, arc length of 250.62 feet, delta angle of 15 degrees 06 minutes 54 seconds (15°06'54"), a chord bearing of South 42 degrees 39 minutes 13 seconds East (S 42°39'13" E), and a chord length of 249.89 feet; thence

South 50 degrees 12 minutes 40 seconds East (S 50°12'40" E), a distance of 91.26 feet; thence

South 39 degrees 47 minutes 20 seconds West (S 39°47'20" W), a distance of 10.00 feet; thence

South 50 degrees 12 minutes 40 seconds East (S 50°12'40" E), a distance of 18.00 feet; thence

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North 39 degrees 47 minutes 20 seconds East (N 39°47'20" E), a distance of 10.00 feet; thence

South 50 degrees 12 minutes 40 seconds East (S 50°12'40" E), a distance of 259.08 feet; thence

along a curve to the right having a radius of 1050.00 feet, arc length of 133.74 feet, delta angle of 07 degrees 17 minutes 53 seconds (07°17'53"), a chord bearing of South 46 degrees 33 minutes 43 seconds East (S 46°33'43" E), and a chord length of 133.65 feet; thence

South 42 degrees 54 minutes 47 seconds East (S 42°54'47" E), a distance of 112.05 feet; thence

along a curve to the left having a radius of 715.00 feet, arc length of 198.66 feet, delta angle of 15 degrees 55 minutes 11 seconds (15°55'11"), a chord bearing of South 50 degrees 52 minutes 22 seconds East (S 50°52'22" E), and a chord length of 198.03 feet to a point on the East line of the SW1/4NW1/4 said Section 9; thence along said East line,

South 00 degrees 39 minutes 40 seconds West (S 00°39'40" W), a distance of 50.40 feet to a point on the Southerly ROW of Midland Avenue; thence along said southerly ROW

South 44 degrees 34 minutes 25 seconds East (S 44°34'25" E), a distance of 112.84 feet to a point on the Northerly ROW of Red Mountain Drive; thence along said Northerly ROW

along a curve to the left having a radius of 124.00 feet, arc length of 73.43 feet, delta angle of 33 degrees 55 minutes 44 seconds (33°55'44"), a chord bearing of South 58 degrees 09 minutes 53 seconds West (S 58°09'53" W), and a chord length of 72.36 feet; thence

North 54 degrees 37 minutes 50 seconds West (N 54°37'50" W), a distance of 373.48 feet;

North 43 degrees 25 minutes 51 seconds West (N 43°25'51" W), a distance of 220.96 feet; thence

North 50 degrees 12 minutes 40 seconds West (N 50°12'40" W), a distance of 131.37 feet; thence

along a non-tangent curve to the left having a radius of 200.00 feet, arc length of 42.95 feet, delta angle of 12 degrees 18 minutes 18 seconds (12°18'18"), a chord bearing of North 72 degrees 17 minutes 46 seconds West (N 72°17'46" W), and a chord length of 42.87 feet; thence

North 78 degrees 26 minutes 55 seconds West (N 78°26'55" W), a distance of 27.55 feet; thence

along a curve to the right having a radius of 100.00 feet, arc length of 95.96 feet, delta angle of 54 degrees 58 minutes 54 seconds (54°58'54"), a chord bearing of North 50 degrees 57 minutes 28 seconds West (N 50°57'28" W), and a chord length of 92.32 feet; thence

North 23 degrees 28 minutes 01 seconds West (N 23°28'01" W), a distance of 143.44 feet; thence

North 41 degrees 03 minutes 52 seconds West (N 41°03'52" W), a distance of 291.31 feet; thence

North 30 degrees 38 minutes 03 seconds West (N 30°38'03" W), a distance of 271.57 feet; thence

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South 54 degrees 53 minutes 57 seconds West (S 54°53'57" W), a distance of 17.75 feet; thence

North 41 degrees 39 minutes 20 seconds West (N 41°39'20" W), a distance of 43.30 feet; thence

North 54 degrees 53 minutes 57 seconds East (N 54°53'57" E), a distance of 22.69 feet; thence

North 35 degrees 06 minutes 03 seconds West (N 35°06'03" W), a distance of 21.42 feet; thence

along a curve to the right having a radius of 1165.00 feet, arc length of 272.23 feet, delta angle of 13 degrees 23 minutes 18 seconds (13°23'18"), a chord bearing of North 28 degrees 24 minutes 24 seconds West (N 28°24'24" W), and a chord length of 271.61 feet; thence

North 21 degrees 42 minutes 46 seconds West (N 21°42'46" W), a distance of 764.09 feet; thence

South 68 degrees 17 minutes 14 seconds West (S 68°17'14" W), a distance of 29.01 feet; thence

North 23 degrees 26 minutes 12 seconds West (N 23°26'12" W), a distance of 78.05 feet; thence

North 68 degrees 17 minutes 14 seconds East (N 68°17'14" E), a distance of 31.36 feet; thence

North 21 degrees 42 minutes 46 seconds West (N 21°42'46" W), a distance of 179.06 feet; thence

along a curve to the left having a radius of 1190.00 feet, arc length of 1104.51 feet, delta angle of 53 degrees 10 minutes 46 seconds (53°10'46"), a chord bearing of North 48 degrees 18 minutes 08 seconds West (N 48°18'08" W), and a chord length of 1065.29 feet; thence

North 76 degrees 22 minutes 36 seconds West (N 76°22'36" W), a distance of 559.87 feet; thence

North 74 degrees 18 minutes 47 seconds West (N 74°18'47" W), a distance of 339.00 feet; thence

South 25 degrees 41 minutes 14 seconds West (S 25°41'14" W), a distance of 42.89 feet; thence

North 66 degrees 02 minutes 34 seconds West (N 66°02'34" W), a distance of 143.01 feet; thence

North 18 degrees 39 minutes 45 seconds West (N 18°39'45" W), a distance of 29.17 feet; thence

North 79 degrees 07 minutes 45 seconds West (N 79°07'45" W), a distance of 369.05 feet; thence

South 14 degrees 21 minutes 02 seconds West (S 14°21'02" W), a distance of 62.19 feet; thence

North 77 degrees 45 minutes 41 seconds West (N 77°45'41" W), a distance of 150.75 feet; thence

North 08 degrees 06 minutes 07 seconds West (N 08°06'07" W), a distance of 62.58 feet; thence

North 74 degrees 58 minutes 24 seconds West (N 74°58'24" W), a distance of 294.83 feet; thence

South 47 degrees 20 minutes 20 seconds West (S 47°20'20" W), a distance of 37.65 feet; thence

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North 87 degrees 48 minutes 31 seconds West (N 87°48'31" W), a distance of 164.69 feet; thence

North 72 degrees 50 minutes 12 seconds West (N 72°50'12" W), a distance of 30.90 feet; thence

North 15 degrees 26 minutes 00 seconds East (N 15°26'00" E), a distance of 81.35 feet; thence

North 79 degrees 21 minutes 26 seconds West (N 79°21'26" W), a distance of 693.85 feet; thence

South 13 degrees 24 minutes 04 seconds West (S 13°24'04" W), a distance of 18.04 feet; thence

South 24 degrees 13 minutes 10 seconds West (S 24°13'10" W), a distance of 200.33 feet; thence

North 83 degrees 20 minutes 39 seconds West (N 83°20'39" W), a distance of 29.12 feet; thence

North 04 degrees 06 minutes 37 seconds East (N 04°06'37" E), a distance of 84.94 feet; thence

North 89 degrees 22 minutes 01 seconds West (N 89°22'01" W), a distance of 220.22 feet; thence

along a curve to the left having a radius of 400.00 feet, arc length of 138.27 feet, delta angle of 19 degrees 48 minutes 21 seconds (19°48'21"), a chord bearing of South 80 degrees 43 minutes 49 seconds West (S 80°43'49" W), and a chord length of 137.58 feet; thence

South 70 degrees 49 minutes 38 seconds West (S 70°49'38" W), a distance of 233.79 feet; thence

South 62 degrees 29 minutes 21 seconds West (S 62°29'21" W), a distance of 379.58 feet; thence

South 02 degrees 31 minutes 55 seconds West (S 02°31'55" W), a distance of 137.01 feet; thence

South 89 degrees 05 minutes 38 seconds West (S 89°05'38" W), a distance of 386.55 feet; thence

along a curve to the right having a radius of 880.00 feet, arc length of 580.98 feet, delta angle of 37 degrees 49 minutes 37 seconds (37°49'37"), a chord bearing of North 71 degrees 59 minutes 34 seconds West (N 71°59'34" W), and a chord length of 570.49 feet; thence

North 53 degrees 04 minutes 45 seconds West (N 53°04'45" W), a distance of 232.27 feet; thence

North 44 degrees 34 minutes 50 seconds West (N 44°34'50" W), a distance of 72.53 feet to the point of beginning. Said parcel contains 27.13 acres more or less.

Subject to easements, reservations, restrictions and rights-of-way of record, existing and in place.



EXHIBIT B

Page 1 of 2

Items to be included in the Final City of Glenwood Springs Alternate Route Plans that are not included in plans of the same name enumerated as follows:

| <u>Sheet No.</u> | <u>Midland Ave STA</u>     | <u>Dated</u> |
|------------------|----------------------------|--------------|
| 1                | 310 + 75.25 to 318 + 95.76 | 01/18/93     |
| 2                | 318 + 95.76 to 328 + 15.83 | 01/18/93     |
| 3                | 328 + 15.83 to 337 + 52.93 | 01/18/93     |
| 4                | 337 + 56.25 to 346 + 75.64 | 10/12/92     |
| 5                | 346 + 75.64 to 355 + 94.52 | 10/12/92     |
| 6                | 355 + 94.52 to 365 + 39.15 | 10/12/92     |
| 7                | 365 + 39.15 to 374 + 84.39 | 10/12/92     |
| 8                | 374 + 84.39 to 384 + 02.69 | 10/12/92     |
| 9                | 384 + 02.69 to 393 + 15.73 | 10/12/92     |
| 10               | 393 + 32.92 to 402 + 21.25 | 12/04/92     |
| 11               | 402 + 21.25 to 405 + 90.80 | 12/04/92     |

1) **Conveyance of Roadway Drainage away from Atkinson Canal**

Between STA. 314+00 and STA. 323+50 the Midland Extension across Wulfsohn Ranch is located immediately above the Atkinson Canal. No roadway drainage from either side of the road shall be allowed to discharge into the Atkinson Canal. This shall be accomplished at the City's discretion, by construction of either curb and gutter or drainage swales adjacent to the paved surface. Drainage swales or curb and gutter shall start at, and discharge into the 24" diameter CMP culvert identified on the plans at STA 313+25.60. The drainage swales or curb and gutter shall extend to and discharge into the 48" diameter CMP culvert identified on the plans at STA 324+95.11.

2) **Access to 2 ± Acre Ou. Parcel Located Northerly and Easterly of Proposed Midland Extension Between STA. 314+00 and STA 329+00.**

Historically, access to the Wulfsohn Ranch has been from the north terminus of Midland Avenue. Access along the historic route shall be maintained by construction of a new "farm access" driveway located at approximately STA 313+50. The exact location shall be at the discretion of the City but shall be located between STA 313+00 and STA 314+00. The farm access driveway shall tie into the existing access road and shall be constructed at a grade of 8% or less.

**EXHIBIT B**

Page 2 of 2

- 3) Location of Storm Drainage and Irrigation Tail water Ditches STA. 324 + 95.11 to STA 405 + 90.80.

All ditches constructed for the purposes of collecting storm water or irrigation runoff water shall be constructed within the Midland Extension Right-of-Way Parcel owned by the City. All such ditches shall discharge to culverts that will convey storm water and irrigation tail water across the Midland Extension. Where storm drainage and tail water ditches are located below historic irrigated land of the Wulfsohn Ranch such ditches shall be capable of conveying, at times, all water rights appurtenant to the Atkinson Canal totalling approximately 24 cfs.

## LEGAL DESCRIPTION OF TEMPORARY CONSTRUCTION EASEMENT PROPERTY

## EXHIBIT MAP

OFF 0916-10: 882

SHOOFLY CONSTRUCTION EASEMENT  
LYING WESTERLY AND EASTERLY OF THE  
WEST GLENWOOD BYPASS RIGHT-OF-WAY

SCALE: 1" = 50'

SOUTHERN PACIFIC  
RAILROAD RIGHT-OF-WAYN 83°39'00" E  
7.07

S 82°19'00" E 92.20'

N 42°36'07" W  
17.15

S 77°01'39" W 73.96

WEST GLENWOOD BYPASS  
RAILROAD RIGHT-OF-WAYWOLFOHNS  
RANCH

$\Delta = 01^{\circ}43'34"$   
 $R = 710.00'$   
 $T = 10.70'$   
 $L = 21.39'$   
 $C = 21.39'$   
 $CB = N 43^{\circ}27'54" W$

WOLFOHNS RANCH

TIE TO THE SOUTHEAST CORNER  
 OF SECTION 8 BEARS  
 S 35°32'14" E 1220.84'

TIE TO THE SOUTHEAST CORNER  
 OF SECTION 8 BEARS  
 S 26°59'26" E 1102.21'

## EASEMENT DESCRIPTION

SHOOFLY CONSTRUCTION EASEMENT  
LYING WESTERLY OF THE WEST GLENWOOD BYPASS RIGHT-OF-WAY

A PARCEL OF LAND SITUATED IN THE SE1/4 OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN, SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 8, A STONE IN PLACE; THENCE N 35°52'14" W 1220.84 TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF THE SOUTHERN PACIFIC RAILROAD, SAID POINT ALSO BEING ON THE WESTERLY RIGHT-OF-WAY OF THE WEST GLENWOOD BYPASS; THENCE LEAVING SAID RAILROAD RIGHT-OF-WAY S 44°34'50" E ALONG THE WESTERLY RIGHT-OF-WAY OF SAID WEST GLENWOOD BYPASS 44.42 FEET; THENCE LEAVING SAID WESTERLY RIGHT-OF-WAY S 83°35'15" W 47.31 FEET; THENCE N 77°07'12" W 108.09 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF THE SOUTHERN PACIFIC RAILROAD; THENCE N 83°39'00" E ALONG SAID SOUTHERLY RIGHT-OF-WAY 120.19 FEET TO THE TRUE POINT OF BEGINNING; SAID PARCEL CONTAINING 2.929 SQUARE FEET, MORE OR LESS.

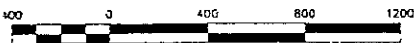
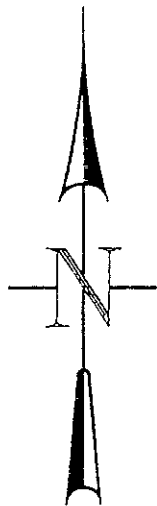
SHOOFLY CONSTRUCTION EASEMENT  
LYING EASTERLY OF THE WEST GLENWOOD BYPASS RIGHT-OF-WAY

A PARCEL OF LAND SITUATED IN THE SE1/4 OF SECTION 8, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN, SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 8, A STONE IN PLACE; THENCE N 26°59'26" W 1102.21 TO A POINT ON THE EASTERLY RIGHT-OF-WAY OF THE WEST GLENWOOD BYPASS; THENCE ALONG SAID EASTERLY RIGHT-OF-WAY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 710.00 FEET AND A CENTRAL ANGLE OF 01°43'34", A DISTANCE OF 21.39 FEET (CHORD BEARS N 43°27'54" W 21.38 FEET); THENCE CONTINUING ALONG SAID EASTERLY RIGHT-OF-WAY N 42°36'07" W 17.15 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF THE SOUTHERN PACIFIC RAILROAD; THENCE LEAVING SAID EASTERLY RIGHT-OF-WAY N 83°39'00" E ALONG SAID SOUTHERLY RIGHT-OF-WAY 7.07 FEET; THENCE LEAVING SAID SOUTHERLY RIGHT-OF-WAY S 82°19'00" E 92.20 FEET; THENCE S 77°01'39" W 73.96 FEET TO THE TRUE POINT OF BEGINNING; SAID PARCEL CONTAINING 1.316 SQUARE FEET, MORE OR LESS.

Boundary Survey  
6-28-96

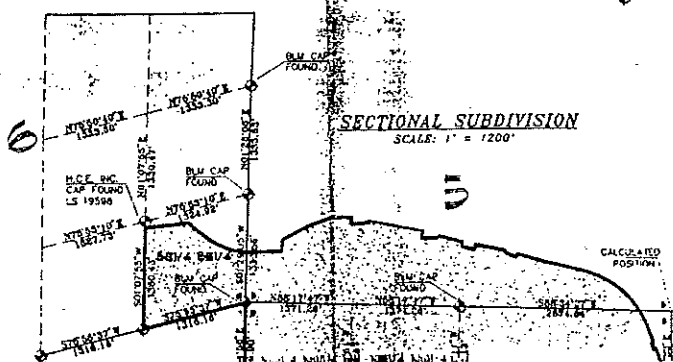
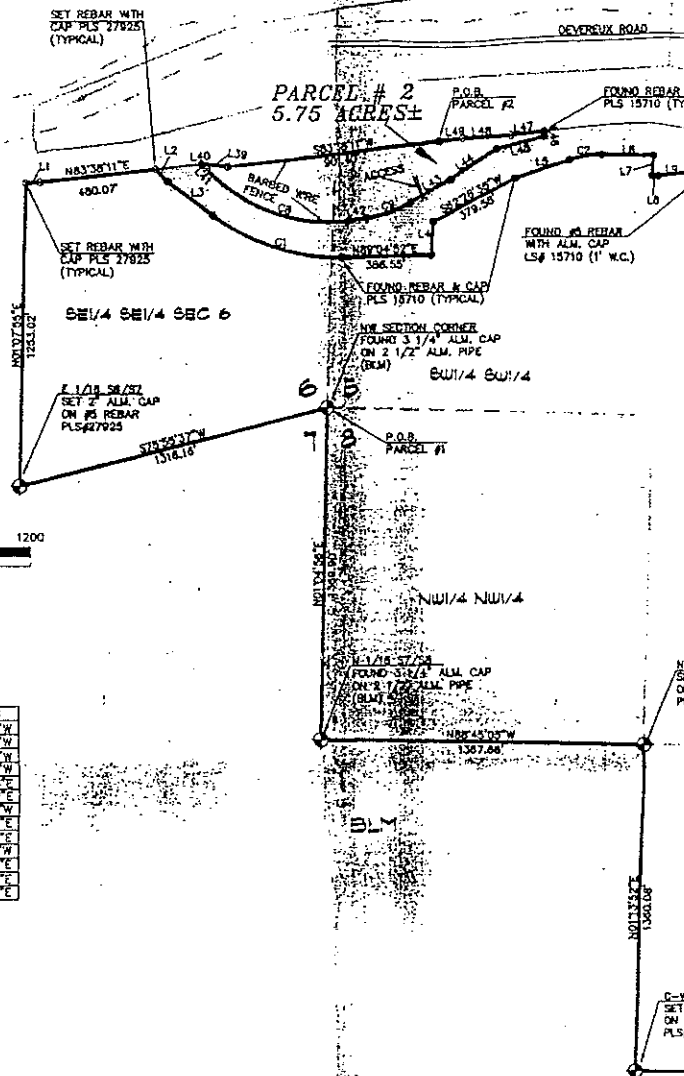
WULF  
SITU



GRAPHIC SCALE IN FEET  
1 INCH = 400 FEET

| CURVE TABLE |          |          |          |             |
|-------------|----------|----------|----------|-------------|
| CURVE       | RADIUS   | LENGTH   | CHORD    | BEARING     |
| C1          | 800.00'  | 380.98'  | 570.49'  | S72°00'20"W |
| C2          | 400.00'  | 136.27'  | 137.58'  | S80°43'01"W |
| C3          | 1130.00' | 1104.51' | 1065.22' | S48°18'54"W |
| C4          | 1165.00' | 272.23'  | 271.61'  | S28°25'10"W |
| C5          | 100.00'  | 95.98'   | 92.32'   | S50°58'14"E |
| C6          | 200.00'  | 42.95'   | 42.87'   | S72°18'32"E |
| C7          | 124.00'  | 35.93'   | 35.80'   | S32°35'04"W |
| C8          | 710.00'  | 877.30'  | 651.91'  | S69°56'35"E |
| C9          | 500.00'  | 194.98'  | 193.74'  | N71°33'27"E |
| C10         | 1507.40' | 561.12'  | 548.06'  | N54°59'25"W |
| C11         | 850.00'  | 250.62'  | 249.89'  | S42°39'59"E |
| C12         | 1050.00' | 133.74'  | 133.85'  | S48°34'29"E |
| C13         | 715.00'  | 198.68'  | 198.02'  | S50°53'08"E |

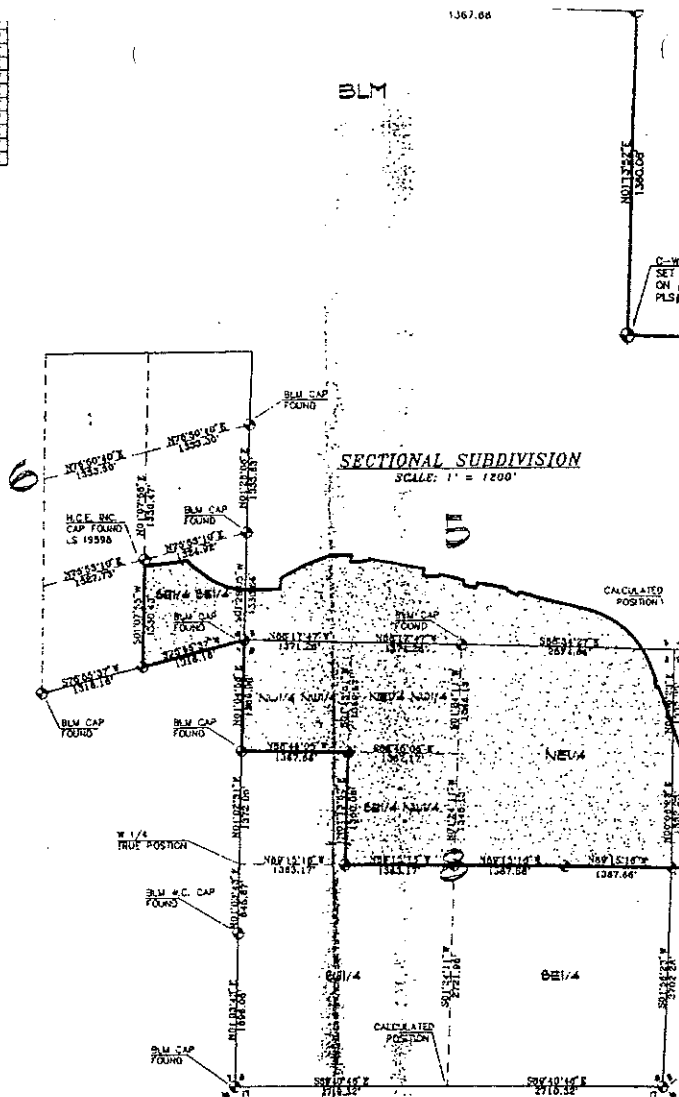
| LINK TABLE |             |          |
|------------|-------------|----------|
| LINK       | DIRECTION   | DISTANCE |
| L1         | N84°20'11"E | 38.27'   |
| L2         | S44°35'38"E | 72.23'   |
| L3         | S33°35'31"E | 22.27'   |
| L4         | N07°31'09"E | 137.01'  |
| L5         | N70°48'47"E | 233.79'  |
| L6         | S82°22'47"E | 220.22'  |
| L7         | S04°05'51"W | 24.24'   |
| L8         | S88°21'25"E | 78.12'   |
| L9         | N84°12'24"E | 200.33'  |
| L10        | N13°22'18"E | 18.04'   |
| L11        | S15°25'14"W | 81.35'   |
| L12        | S72°50'58"E | 30.80'   |
| L13        | S87°49'17"E | 164.69'  |
| L14        | N47°15'34"E | 37.65'   |
| L15        | S74°58'10"E | 294.83'  |
| L16        | S08°59'59"E | 92.48'   |
| L17        | S77°46'27"E | 150.75'  |
| L18        | N14°20'18"E | 82.19'   |
| L19        | S79°08'31"E | 369.05'  |
| L20        | S18°40'31"E | 28.17'   |
| L21        | S66°53'20"E | 143.01'  |
| L22        | N23°40'28"E | 42.89'   |
| L23        | S74°19'13"E | 339.00'  |
| L24        | S21°43'52"E | 179.06'  |
| L25        | S68°18'28"W | 31.35'   |
| L26        | S27°28'58"E | 78.05'   |
| L27        | N68°18'28"E | 29.01'   |
| L28        | S38°29'49"E | 21.42'   |
| L29        | S44°53'11"W | 22.69'   |
| L30        | S41°40'08"E | 43.30'   |
| L31        | N54°53'11"E | 17.75'   |
| L32        | S30°38'49"E | 271.57'  |
| L33        | S41°34'38"E | 231.31'  |



|     |          |         |          |             |
|-----|----------|---------|----------|-------------|
| C3  | 1130.00' | 104.51' | 1055.42' | S48°18'51"W |
| C4  | 1165.00' | 272.23' | 271.51'  | S28°25'10"W |
| C5  | 100.00'  | 95.96'  | 92.32'   | S50°58'14"E |
| C6  | 200.00'  | 42.82'  | 42.87'   | S72°18'32"E |
| C7  | 124.00'  | 15.93'  | 15.80'   | S32°55'06"W |
| C8  | 710.00'  | 677.30' | 651.91'  | S69°56'35"E |
| C9  | 400.00'  | 194.38' | 193.23'  | N71°33'27"E |
| C10 | 1507.40' | 551.12' | 548.06'  | N54°59'25"W |
| C11 | 950.00'  | 250.62' | 249.89'  | S42°39'59"E |
| C12 | 1050.00' | 133.74' | 133.65'  | S48°34'29"E |
| C13 | 715.00'  | 198.66' | 198.02'  | S50°53'08"E |

LINK TABLE

| LINE | DIRECTION   | DISTANCE |
|------|-------------|----------|
| L1   | N66°20'11"E | 58.27    |
| L2   | S44°39'36"E | 79.53    |
| L3   | S31°09'31"E | 232.27   |
| L4   | N02°11'29"E | 137.01   |
| L5   | N70°48'52"E | 233.79   |
| L6   | S89°22'47"E | 220.22   |
| L7   | S04°04'51"W | 84.94    |
| L8   | S98°21'25"E | 29.12    |
| L9   | N84°12'24"E | 200.33   |
| L10  | N17°31'18"E | 18.04    |
| L11  | S15°25'14"W | 81.35    |
| L12  | S72°50'58"E | 30.90    |
| L13  | S87°49'17"E | 164.69   |
| L14  | N47°35'34"E | 32.55    |
| L15  | S74°50'10"E | 294.83   |
| L16  | S08°08'53"E | 294.58   |
| L17  | S27°46'27"E | 150.25   |
| L18  | N14°20'16"E | 82.19    |
| L19  | S79°06'31"E | 589.05   |
| L20  | S18°46'31"E | 29.17    |
| L21  | S06°31'20"E | 143.01   |
| L22  | N25°40'28"E | 42.89    |
| L23  | S74°19'33"E | 338.00   |
| L24  | S21°43'32"E | 179.08   |
| L25  | S68°18'28"W | 31.38    |
| L26  | S43°28'58"E | 78.05    |
| L27  | N68°16'28"E | 29.01    |
| L28  | S35°06'49"E | 21.42    |
| L29  | S54°53'11"W | 22.69    |
| L30  | S41°40'08"E | 43.30    |
| L31  | N64°53'11"E | 17.75    |
| L32  | S29°38'49"E | 271.57   |
| L33  | S41°03'38"E | 291.91   |
| L34  | S21°28'47"E | 143.44   |
| L35  | S78°27'41"E | 27.55    |
| L36  | S50°13'28"E | 131.27   |
| L37  | S43°28'17"E | 220.95   |
| L38  | S00°39'40"W | 82.52    |
| L39  | N87°19'49"W | 103.10   |
| L40  | S81°18'11"W | 7.05     |
| L41  | S42°28'51"E | 17.15    |
| L42  | N82°43'44"E | 80.93    |
| L43  | N60°23'10"E | 185.42   |
| L44  | N58°38'55"E | 230.74   |
| L45  | N75°17'22"E | 201.74   |
| L46  | N02°11'29"E | 19.87    |
| L47  | S81°28'11"W | 132.79   |
| L48  | S86°20'11"W | 200.30   |
| L49  | S81°38'11"W | 98.60    |
| L51  | N70°07'49"W | 195.45   |
| L52  | N68°27'19"W | 235.00   |
| L53  | S24°32'11"W | 25.00    |
| L54  | S54°50'12"W | 20.12    |
| L55  | S35°08'32"E | 163.12   |
| L56  | S50°13'28"E | 91.26    |
| L57  | S39°48'34"W | 10.00    |
| L58  | S50°13'28"E | 18.00    |
| L59  | N39°48'34"E | 10.00    |
| L60  | S50°13'28"E | 259.08   |
| L61  | S42°50'33"E | 112.05   |



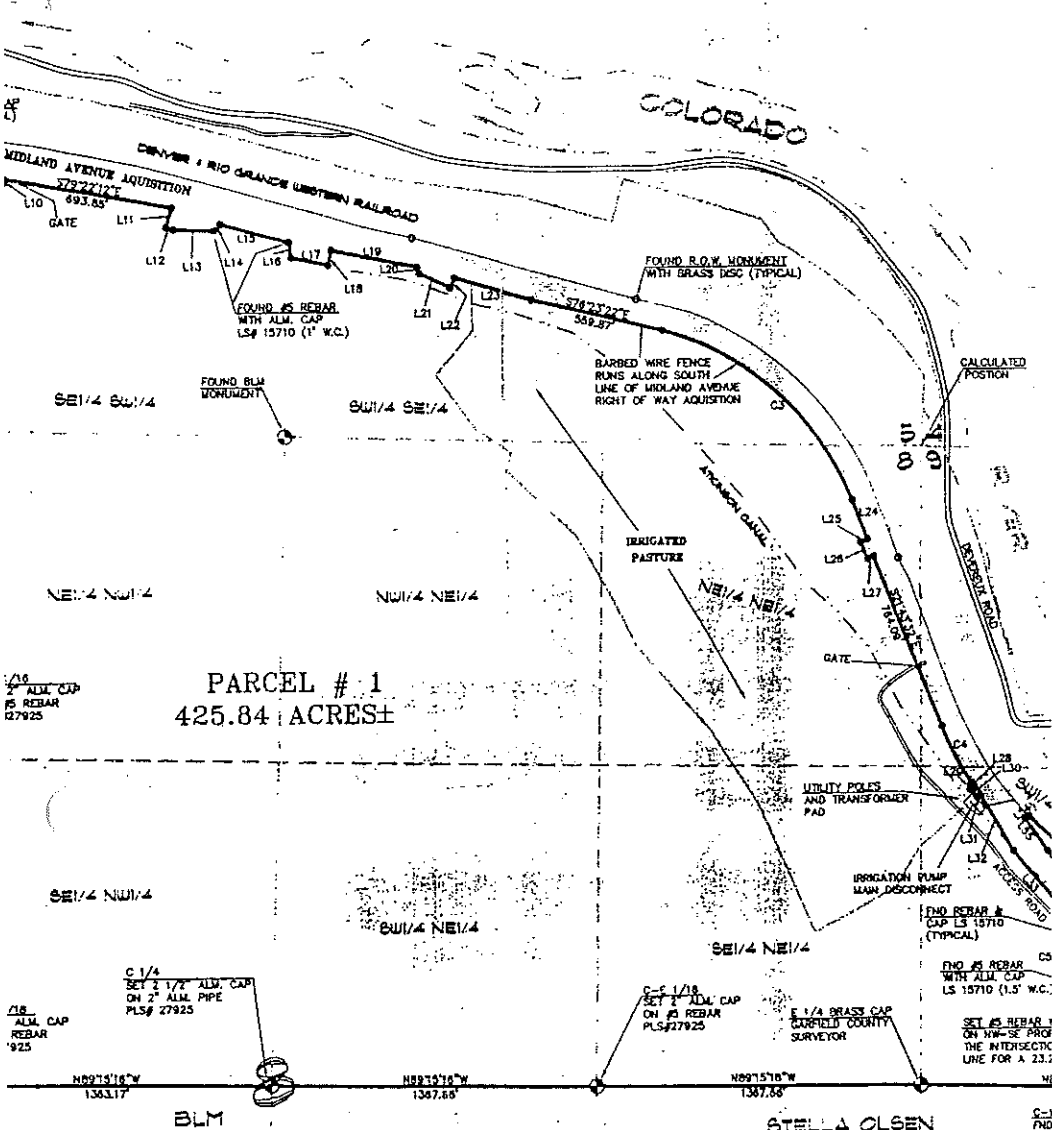
NOTE

ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY DEFECT IN THIS SURVEY WITHIN 3 YEARS AFTER YOU FIRST NOTICE ANY ACTION BASED UPON ANY DEFECT IN 1 YEAR FROM THE DATE OF CERTIFICATION SHOWN



# JOHN RANCH BOUNDARY SURVEY

LOCATED IN SECTIONS 5, 6, 8 & 9 T.6.S. R.89.W. 6th  
COUNTY OF GARFIELD, STATE OF COLORADO



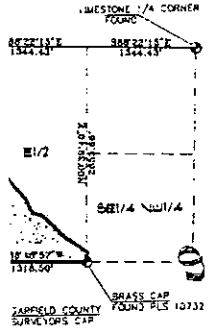
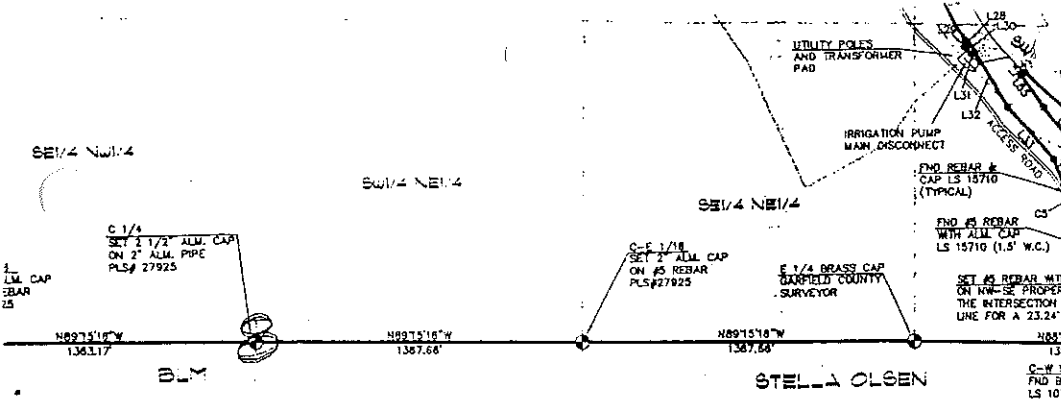
## PARCEL # 2 LEGAL DESCRIPTION

A parcel of land situated in Sections 5 and 8, Township 6 South, Range 89, West of the 6th Principal Meridian, County of Garfield, State of Colorado, said parcel being more particularly described as follows:

Beginning at a concrete Right-of-Way monument found on the Southerly Right-of-Way of the Denver and Rio Grande Western Railroad whence the BLM alum cap in place and properly marked for the Southwest corner of said Section 5 bears S 23°29'57" E 1196.71 feet;  
Thence along said Southerly Right-of-Way the following (3) courses: thence S 87°38'11" E 901.49 feet; thence N 82°19'49" E 103.10 feet; thence S 85°38'11" E 7.05 feet leaving said Southerly Right-of-Way; thence along the Northerly Right-of-Way of the Midland Ave. Right-of-Way Acquisition the following (8) courses: thence S 42°38'55" E 17.15 feet; thence along a curve to the left having a radius of 710.00 feet and an arc length of 677.30 feet, the chord of which bears S 69°58'35" E 651.91 feet; thence N 42°43'44" E 80.93 feet; thence along the arc of a curve to the left having a radius of 500.00 feet and an arc length of 194.98 feet, the chord of which bears N 71°33'27" E 193.75 feet; thence N 60°23'10" E 185.42 feet; thence N 58°38'55" E 230.74 feet; thence N 75°17'22" E 201.74 feet; thence N 08°21'46" E 13.87 feet leaving said Northerly Right-of-Way.

## NOTES:

- 1) Bearings shown herein are between found survey monuments at the centerline intersection and 8th Street & Bluffs.
- 2) Various apparent utility lines through Parcels #1, #2 and in the Title Commitment not graphically shown.
- 3) The Southerly Right-of-Way Acquisition encroaches on certain locations.
- 4) Plans & Book refers to...



U. ACTION BASED UPON ANY  
OTHER SUCH DEFECT, IN  
SURVEY BE COMMENCED MORE  
REAR

**PARCEL # 2 LEGAL DESCRIPTION**

A parcel of land situated in Sections 5 and 8, Township 8 South, Range 89 West of the 6th Principal Meridian, County of Garfield, State of Colorado, said parcel being more particularly described as follows:

Beginning at a concrete Right-of-Way monument found on the Southern Right-of-Way of the Denver and Rio Grande Eastern Railroad whence the BLM alum cap in place and properly marked for the Southwest corner of said Section 5 bears S 23°29'57\"

**NOTES:**

- 1) Bearings shown hereon are between found survey mon at the centerline intersects and 8th Street & Blake Ave
- 2) Various apparent utilities in three Parcels #1, #2 and #3 in the Title Commitment, not graphically shown at :
- 3) The Southern Right of Way Acquisition encroaches on the certain locations.
- 4) Plan & Deed references include following:  
a) Roaring Fork Subdivision  
b) Mountain View Subdivision  
c) Colorado Department of reception numbers 2390  
d) Quit Claim Deed dated  
e) Warranty Deed dated 6/  
f) C.L.O. Survey Plate date  
g) Chatfield Ranch Bounda High Country Engineer  
h) ALTA commitment completed 5/9/96, Order # 1

**PARCEL # 3 LEGAL DESCRIPTION**

A parcel of land situated Southerly of the Denver & Rio Grande Western Railroad (D&RW) Right-of-Way and Northerly of the Midland Avenue Acquisition right of way (Midland ROW), located in the SW1/4 NW1/4 of Section 9, Township 8 South, Range 89 West of the 6th Principal Meridian, County of Garfield, State of Colorado, the parcel being more particularly described as follows:

Beginning at the Southeast corner of said parcel whence the brass cap found at the Center West 1/16 corner of Section 9 bears S 00°39'40\"

DEPOSITED THIS \_\_\_\_ DAY OF  
GARFIELD COUNTY INDEX FOR  
RECEPTION NO. \_\_\_\_

BY: \_\_\_\_\_  
GARFIELD COUNTY SURVEYOR

DATE, \_\_\_\_\_

FILING INFORMATION: SECTION \_\_\_\_

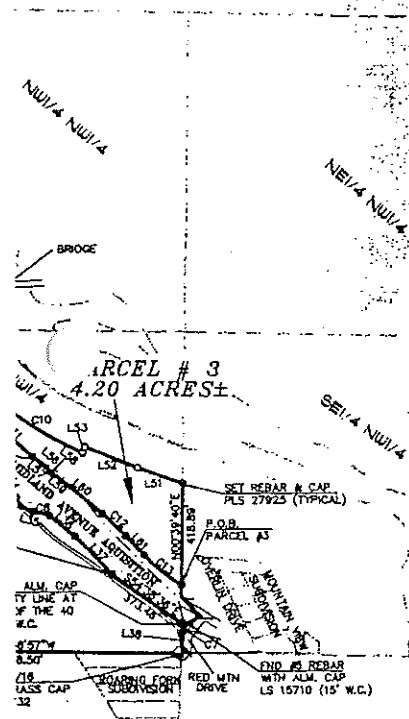
# URVEY

P.M.

## PARCEL # 1 LEGAL DESCRIPTION

All that property located in the NW1/4 NW1/4 and E1/2 NW1/4 of Section 8; that portion of the NW1/4 of said Section 8 located south of the Southerly Right of Way line of the Midland Avenue Right of Way Acquisition; that portion of the W1/2 NW1/4 of Section 9 located south of the Southerly Right of Way line of said Midland Avenue Right of Way Acquisition; that portion of the SE1/4 of the NW1/4 of said Section 9 being triangular in shape bounded on the west by the Westerly line of the SE1/4 NW1/4 of said Section 9, on the north by the Southerly line of said Midland Avenue Right of Way Acquisition and on the south by the West line of the Red Mountain Drive Right of Way; that portion of the S1/2 S1/2 of Section 5 located south of the Southerly Right of Way line of said Midland Avenue Right of Way Acquisition; that portion of the SE1/4 SE1/4 of Section 6 located south of the Southerly Right of Way line of said Midland Avenue Right of Way Acquisition and the Denver & Rio Grande Western Railroad Right of Way All located in Township 8 South, Range 80 East of the 6th Principal Meridian. The property as mentioned above being more particularly described by Metes and Bounds for acreage as follows:

Beginning at the South East corner of said Section 6; thence S75°55'37"E, a distance of 1316.18 feet along the Southerly line of said Section 6 to the East 1/16 corner common to said Sections 6 and 7; thence N8°07'55"E, a distance of 1253.02 feet along the West line of the SE1/4 SE1/4 of said Section 8 to the Southerly Right of Way line of said Denver Rio Grande Western Railroad Right of Way; thence along said Right of Way line the following (2) courses: thence N86°20'11"E, a distance of 58.27 feet; thence N83°38'11"E, a distance of 480.07 feet to the Southerly Right of Way line of said Midland Avenue Right of Way Acquisition; thence along said Right of Way line the following (47) courses, thence S44°38'36"E, a distance of 72.53 feet; thence S33°05'31"E, a distance of 232.27 feet; thence along the arc of a curve to the left a distance of 580.98 feet, having a radius of 880.00 feet, the chord of which bears S72°00'20"E, a distance of 570.49 feet; thence N89°04'52"E, a distance of 328.55 feet; thence N02°31'09"E, a distance of 137.01 feet; thence N62°28'36"E, a distance of 379.58 feet; thence N70°48'52"E, a distance of 238.79 feet; thence along the arc of a curve to the right a distance of 138.27 feet, having a radius of 400.00 feet, the chord of which bears N80°42'05"E, a distance of 139.58 feet; thence S89°22'47"E, a distance of 220.22 feet; thence S04°05'51"W, a distance of 84.94 feet; thence S88°21'25"E, a distance of 29.12 feet; thence N84°12'24"E, a distance of 200.33 feet; thence N15°31'18"E, a distance of 18.04 feet; thence S73°22'12"E, a distance of 698.85 feet; thence S16°35'14"W, a distance of 81.35 feet; thence S72°50'58"E, a distance of 30.30 feet; thence S87°49'17"E, a distance of 184.89 feet; thence N47°19'34"E, a distance of 37.65 feet; thence S75°59'10"E, a distance of 294.83 feet; thence S08°08'53"E, a distance of 62.58 feet; thence S74°45'37"E, a distance of 150.75 feet; thence N1°20'16"E, a distance of 62.19 feet; thence S79°09'31"E, a distance of 369.05 feet; thence S18°40'31"E, a distance of 29.17 feet; thence S68°09'20"E, a distance of 143.01 feet; thence N25°40'28"E, a distance of 42.89 feet; thence S74°19'35"E, a distance of 339.00 feet; thence S76°23'22"E, a distance of 559.87 feet; thence along the arc of a curve to the right a distance of 1104.51 feet, having a radius of 1190.00 feet, the chord of which bears S48°18'54"E, a distance of 1085.29 feet; thence S21°43'32"E, a distance of 179.05 feet; thence S88°18'28"W, a distance of 31.38 feet; thence S23°28'58"E, a distance of 78.06 feet; thence N88°18'48"E, a distance of 29.01 feet; thence S24°43'32"E, a distance of 764.09 feet; thence along the arc of a curve to the left a distance of 272.23 feet, having a radius of 1165.00 feet, the chord of which bears S28°25'10"E, a distance of 277.01 feet; thence S35°08'49"E, a distance of 221.42 feet; thence S64°53'11"E, a distance of 22.69 feet; thence S41°49'05"E, a distance of 43.30 feet; thence N64°53'11"E, a distance of 17.75 feet; thence S30°38'49"E, a distance of 271.57 feet; thence S41°04'38"E, a distance of 291.31 feet; thence S23°28'47"E, a distance of 143.44 feet; thence along the arc of a curve to the left a distance of 95.98 feet, having a radius of 100.00 feet, the chord of which bears S50°59'14"E, a distance of 92.32 feet; thence S78°27'41"E, a distance of 27.55 feet; thence along the arc of a curve to the right a distance of 42.95 feet, having a radius of 200.00 feet, the chord of which bears S72°18'32"E, a distance of 42.87 feet; thence S50°13'25"E, a distance of 131.37 feet; thence S43°26'37"E, a distance of 220.95 feet; thence S54°38'35"E, a distance of 372.46 feet to the Westerly Right of Way line of said Red Mountain Drive Right of Way; thence along said Right of Way line the following (2) courses: thence along the arc of a curve to the left a distance of 35.93 feet, having a radius of 124.00 feet, the chord of which bears S32°55'08"W, a distance of 35.80 feet to the East line of the SW1/4 NW1/4 of said Section 9; thence along said East line S00°39'40"W, a distance of 82.52 feet to the Center West 1/16 corner of said Section 9; thence leaving said Right of Way and along the East West center line of said Section 9 N88°48'57"W, a distance of 1318.50 feet to the East 1/4 corner of said Section 8; thence along the East West center line of said Section 8 N89°15'16"W, a distance of 2735.34 feet to the Center 1/4 corner of said Section 8; thence continuing along the East West center line of said Section 8 N89°15'16"W, a distance of 1363.17 feet to the Center West 1/16 corner of said Section 8; thence along the West line of the SE1/4 NW1/4 of said Section 8 N01°13'52"E, a distance of 1380.08 feet to the NW1/16 corner of said Section 8; thence along the South line of the NW1/4 NW1/4 of said Section 8 N88°45'05"W, a distance of 1387.68 feet to the N1/16 corner common to said Sections 7 and 8; thence along the West line to the NW corner of said Section 8 N01°04'56"E, a distance of 1389.30 feet to the Point of Beginning containing 425.84 acres more or less.



based on a bearing of N88°28'W  
monuments situated in Range boxes located  
near 8th Street & Midland Avenue  
near, in the City of Glenwood Springs.

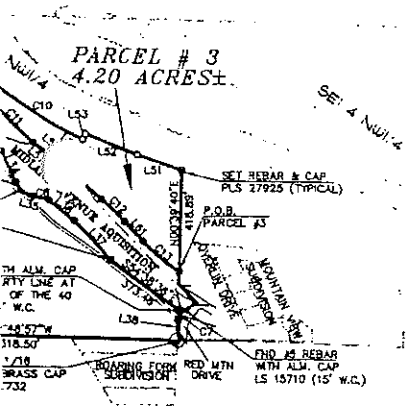
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The statements of record are stated  
on (4)(h) shown below. Said utilities were  
at clients request.

ence of the Midland Avenue  
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## SURVEYOR'S CERTIFICATE

THIS IS TO CERTIFY THAT THE SURVEY SHOWN ON THIS PLAT WAS MADE BY  
CONSTRUCTION SURVEYS, INC. UNDER MY DIRECT SUPERVISION, RESPONSIBILITY AND  
CHECKING AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND  
BELIEF





thence along the arc of a curve to the left a distance of 272.23 feet, having a radius of 1145.00 feet, the chord of which bears S28°25'10"E, a distance of 272.01 feet; thence along the arc of a curve to the left a distance of 1606'48"E, a distance of 28'42" feet; thence S54°53'11"W, a distance of 22.59 feet; thence S44°40'08"E, a distance of 43.30 feet; thence N54°53'11"E, a distance of 17.75 feet; thence S30°38'48"E, a distance of 271.57 feet; thence S41°04'38"E, a distance of 291.31 feet; thence S25°28'47"E, a distance of 149.44 feet; thence along the arc of a curve to the left a distance of 35.98 feet, having a radius of 100.00 feet, the chord of which bears S50°50'14"E, a distance of 32.32 feet; thence S78°27'41"E, a distance of 27.58 feet; thence along the arc of a curve to the right a distance of 42.95 feet, having a radius of 200.00 feet, the chord of which bears S72°18'32"E, a distance of 42.87 feet; thence S50°13'28"E, a distance of 131.57 feet; thence S45°28'37"E, a distance of 420.95 feet; thence S54°38'38"E, a distance of 373.46 feet to the Western Right of Way line of said Red Mountain Drive Right of Way; thence along said Right of Way the following (2) courses: thence along the arc of a curve to the left a distance of 35.93 feet, having a radius of 124.00 feet, the chord of which bears S32°55'08"W, a distance of 35.80 feet to the East line of the S71/4 NW1/4 of said Section 9; thence along said East line of the S71/4 NW1/4 of said Section 9; thence along said East line 200°39'40"W, a distance of 32.52 feet to the Center West 1/16 corner of said Section 9; thence leaving said Right of Way and along the East West center line of said Section 9 N88°48'57"W, a distance of 1318.50 feet to the East 1/4 corner of said Section 8; thence along the East West center line of said Section 8 N88°16'18"W, a distance of 2735.32 feet to the Center 1/4 corner of said Section 8; thence continuing along the East West center line of said Section 8 N88°15'18"W, a distance of 1363.17 feet to the Center West 1/16 corner of said Section 8; thence along the West line of the S21/4 NW1/4 of said Section 8 N01°13'52"E, a distance of 1360.08 feet to the NW1/16 corner of said Section 8; thence along the South line of the NW1/4 NW1/4 of said Section 8 N88°45'05"W, a distance of 1067.66 feet to the NW1/16 corner common to said Sections 7 and 8; thence along the East line to the NW corner of said Section 8 N01°04'58"E, a distance of 1369.90 feet, to the Point of Beginning containing 425.84 acres more or less.

based on a bearing of N88°28'W  
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Highways  
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7/7/57, recorded at Book 297, Pages 35-97  
7/71, recorded at Book 421, Page 387  
1885 & 1888  
y Survey, by  
g dated March, 1996.  
led by Land Title Guarantee Company  
#320842.

### SURVEYOR'S CERTIFICATE

THIS IS TO CERTIFY THAT THE SURVEY SHOWN ON THIS PLAT WAS MADE BY  
CONSTRUCTION SURVEYS, INC. UNDER MY DIRECT SUPERVISION, RESPONSIBILITY AND  
CHECKING AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND  
BELIEF.

BY:   
GEORGE R. BADER, PROFESSIONAL LAND SURVEYOR  
7/11/96  
27925

CONSTRUCTION SURVEYS INC.  
0012 SUNRISE BLVD.  
SILT, CO 81632  
970-876-5753

PREPARED FOR:  
UNOCAL CORPORATION  
COUNTY ROAD 215  
PARACHUTE, COLORADO  
81635



|                |                      |
|----------------|----------------------|
| DRAWN BY: B.H. | CHECKED BY: GRB      |
| DATE: 6/28/96  | DWG: UNOCAL\WULFSOHN |

REVISION: 7/11/96 Amend Parcel #1 legal desc. & plot

...396, AT ... W., IN THE  
FORMATIONAL LAND SURVEY PLATS UNDER

TOWNSHIP ... RANGE ... 6th P.M.

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1 of 14 R 71.00 D 0.00 GARFIELD COUNTY CO

## ACQUISITION AND EXCHANGE AGREEMENT

**THIS AGREEMENT** is made and entered into as of March 16, 1999, by and between GLENWOOD MEADOWS, LLC, a Colorado limited liability company (hereinafter "GM"), and the CITY OF GLENWOOD SPRINGS, a Colorado home-rule municipality (hereinafter "City");

WHEREAS, the City is the owner of certain real property located within the municipal limits of the City, Garfield County, Colorado, commonly known as the Salt Plant Property (hereinafter the "Salt Plant Property") as described by Exhibit A attached hereto and by this reference incorporated herein; and

WHEREAS, GM is the owner of certain property located in Garfield County, Colorado, commonly known as the Wulfsohn Ranch (hereinafter "Wulfsohn Ranch"); and

WHEREAS, GM is the owner of various water rights decreed to the Atkinson Canal, the headgate for which is generally located as described in the decree entered September 7, 1976, in Case No. W-2910 (Water Division No. 5), which water rights, Atkinson Canal and existing lateral ditches are used to provide irrigation water to irrigated portions of the Wulfsohn Ranch ("Irrigated Acres"); and

WHEREAS, the City desires and intends to acquire approximately ten (10) to twelve (12) acres of presently Irrigated Acres and approximately twenty-five (25) acres of non-irrigated lands all on the Wulfsohn Ranch from GM (hereafter, the "Community Center Property") as described by Exhibit B attached hereto and by this reference incorporated herein, in exchange for approximately 8.856 acres, being all of the Salt Plant Property land situated in and around the City at the intersection of Devereux Road and Highway 6 & 24; and

WHEREAS, the City has provided GM with notice of the City's intent to exchange the Salt Plant Property for that portion of the Wulfsohn Ranch, identified as the Community Center Property, which is needed to construct the "City Community Center Project"; and

WHEREAS, the City and GM have (i) prepared and delivered appraisals, (ii) exchanged title insurance commitments, environmental and soils analysis and (iii) engaged in negotiations concerning the City's intended acquisition of the Community Center Property on the Wulfsohn Ranch and GM's intended acquisition of the Salt Plant Property; and

WHEREAS, GM has agreed to convey to the City title to that portion of the Wulfsohn Ranch described as the Community Center Property in this Agreement, subject to the terms and conditions of this Agreement; and

WHEREAS, the City has agreed to convey to GM title to the Salt Plant Property as described in this Agreement, subject to the terms and conditions of this Agreement; and

WHEREAS, the City has not used the Salt Plant Property, or any portion or part thereof, for any "municipal purpose" as that phrase is set forth and used in the City Charter or the City Municipal Code; and



GW 224834

Return to: City of Glenwood Springs  
ATTN: Teresa Williams  
806 Cooper Ave  
Glenwood Springs, CO 81600



WHEREAS, GM has commenced the process of annexing the Wulfsohn Ranch, including that portion identified herein as the Community Center Property; and

WHEREAS, the City agrees to cooperate with and join in said petition for annexation with respect to said Community Center Property; and

WHEREAS, the parties desire to set forth herein their agreement concerning the exchange and conveyance (i) from GM to the City of that portion of the Wulfsohn Ranch required for the Community Center Project, (ii) from the City to GM of the Salt Plant Property, and (iii) related matters.

NOW, THEREFORE, for and in consideration of the above recitals, the mutual covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, GM and the City agree as follows:

1. Exchange and Conveyance of Community Center Property and The Salt Plant Property.

Upon closing of these premises at a mutually agreeable date and time between the date hereof and March 30, 1999, at the offices of Land Title Guarantee Company located at 817 Colorado Avenue, Glenwood Springs, Colorado, the following shall occur:

A. GM shall convey by Special Warranty Deed to the City that portion of the Wulfsohn Ranch described upon Exhibit A as annexed hereto. Said conveyance shall be subject to all matters of public record affecting the subject property as well as the following additional matters:

(i) GM shall reserve from the conveyance to the City a perpetual easement of thirty (30) feet in width for the maintenance, operation, repair and replacement of the Atkinson Canal, such easement lying fifteen (15) feet on either side of the centerline of any portion of the Atkinson Canal or lateral ditch structure presently situate on the lands to be conveyed to the City for so long as the Atkinson Canal shall be necessary to GM for the delivery of irrigation water to the remainder of the Wulfsohn Ranch; and

(ii) GM shall reserve from the conveyance to the City a five (5) year easement for the continued operation of the Pump Station presently situate on the real property to be conveyed to the City, together with an easement adequate to access said Pump Station for the purposes of maintenance, operation, repair and replacement.

(iii) GM shall reserve from the conveyance to the City a debris flow drainage easement situate between the Irrigated Acres and the remainder of the Community Center Property for the sole and exclusive purpose of directing and mitigating debris flows from other portions of the Wulfsohn Ranch; the precise location and dimensions of which debris flow drainage easement to be determined at a later date and subject to the approval of the City, which approval shall not be unreasonably withheld.

B. The City shall convey by General Warranty Deed to GM the three (3) lots which comprise the Salt Plant Property as described upon Exhibit B as annexed hereto,

together with all improvements thereon, geothermal water sources and rights historically used thereon or associated therewith and all other hereditaments appertaining thereto. Said conveyance shall be subject to all matters of public record affecting the subject property. The City shall also execute and deliver (i) a bill of sale transferring to GM all right, title and interest of the City in and to any personal property, easements, rights-of-way and other assets situate upon or historically associated with the Salt Plant Property and (ii) an Assignment and Assumption Agreement assigning to GM all right, title and interest of the City to any leases or other agreements affecting the Salt Plant Property.

C. Each party shall pay an equal amount of any closing costs associated with the transactions contemplated hereby.

D. Each party hereto shall pay all costs of recording such instruments received by that party, including any deeds, and each party hereto shall pay an equal amount of the costs of recording other closing documents required by this Agreement, including any covenants, and shall undertake all other reasonable steps necessary to effectuate the intent of this Agreement, specifically including, but without limitation whatsoever, (i) the recordation of any plats required to satisfy C.R.S 30-28-101 et. seq. with respect to the statutory exception from the definition of "subdivision" and the subdivision regulations of Garfield County, Colorado, and (ii) the filing of appropriate maps and other documents with the Garfield County Assessor's office.

E. With respect to the lands conveyed by each party hereto, the conveying party hereto shall pay the premium for and deliver to the other party, within a reasonable time after closing, an ALTA Form of title insurance policy based upon previously issued title insurance commitments. The amount of title insurance shall be equal to the valuation of the subject property by the appraisals previously issued.

Real property taxes shall be prorated to the day of closing based upon the most recent mill levy and most recent assessment and shall be determined by the ratio the Community Center Property bears to the Wulfsohn Ranch as a whole. The parties acknowledge and agree that under this Agreement, GM has not agreed to and does not intend to convey any of its water rights or any interest in and to the Atkinson Canal and its lateral ditches or GM's right to continue to utilize said water rights and said Atkinson Canal and lateral ditches for the irrigation of the Irrigated Acres and any additional lands which will be irrigated in replacement of the Irrigated Acres to be conveyed to the City.

2. Salt Plant Property Land Use Designations. The City hereby agrees and acknowledges that (i) the Salt Plant Property is comprised of three (3) separate and individual lots, each of which may be conveyed distinct from the others without the necessity of a subdivision process and the lot lines of which may be adjusted in accordance with the procedures set forth in the Glenwood Springs Land Use Code. The City further acknowledges and agrees that the zoning of the entire Salt Plant Property shall be or is within the C-1 Commercial zone district, has municipal utility service on site or within reasonable proximity thereto and has two (2) existing and legal access points to and from public roads and/or rights-of-way.

3. Community Center Project. If and when the City proceeds to construct the Community Center Project, the City shall, at its sole expense and at no expense to GM except as expressly provided for herein, undertake and complete all road installation, road surfacing, grading, drainage improvements, utility extensions, fencing, culverting, and other work for the Community Center Project in accordance with (A)

plans reviewed by GM (hereinafter "Community Center Project Plans") and accepted by GM with respect to such plans' impacts on GM's ongoing interests in (i) the Atkinson Canal and lateral ditches and (ii) the Pump Station, which review shall be timely and which acceptance shall not be unreasonably withheld; (B) technical specifications prepared for materials for canal culverting previously approved by GM (hereinafter "Community Center Project Specifications") which approval by GM shall not be unreasonably withheld, and (C) the Engineering Standards generally accepted in the industry (hereinafter "Engineering Standards"). The Community Center Project Plans, the Community Center Project Specifications and the Engineering Standards are hereinafter referred to individually, or collectively as the Community Center Project Plans and Specifications.

4. Purpose. One of the purposes of this Agreement is to ensure that GM's interests, including specifically GM's controlling ownership and use of the Atkinson Canal and the Atkinson Ditch Company, Inc. and GM's ownership of the remaining portions of the Wulfsohn Ranch, are not adversely affected by the City's Community Center Project. For purposes of this Agreement, all references to "Community Center Project" refer solely and specifically to those components of the City's project which affect (i) the Pump Station situated on the Community Center Property, (ii) the Atkinson Canal structures or easements, or (iii) drainage which affects the Atkinson Canal structure or easement.

5. Project Control. The City shall be solely responsible for the construction, installation, and completion of the Community Center Project and appurtenant facilities and, except as expressly provided for herein to the contrary, all costs associated therewith. Upon GM's opportunity to review and approve, which approval shall not be unreasonably withheld, the Community Center Project Plans and Specifications, the City shall be authorized to commence the Community Center Project, as contemplated in the Community Center Project Plans and Specifications; provided, however, no construction shall interfere with GM's ability to use the Atkinson Canal structures and the water carried thereby for irrigation purposes during the irrigation season.

6. Non-Interference with Agricultural Operations. The City agrees, for itself and its agents, employees, contractors, subcontractors and material suppliers, to (A) keep construction activity for the Community Center Project within the Community Center Property; (B) ensure that GM, its tenants and lessees will have access to the Wulfsohn Ranch during work on the Community Center Project, and (C) ensure that the Atkinson Canal will carry irrigation water and the Pump Station will direct such water and both will be operational for use by GM, its tenants and lessees for irrigation and other purposes during the irrigation season (April 15 - October 31) and, for that purpose, the City shall not undertake canal culverting or other work on the Atkinson Canal or similar work on the Pump Station during the irrigation season without the written consent of GM, which consent shall not be unreasonably withheld.

7. Fencing. To the extent possible, the parties hereto agree to maintain such existing fencing between the Community Center Property and the remainder of the Wulfsohn Ranch. Prior to commencement of any work on the Community Center Project, the City shall take all steps reasonably necessary to secure the Community Center Property from either (i) the agricultural activities of the adjacent remainder of the Wulfsohn Ranch and/or (ii) GM's development activities on the remainder of the Wulfsohn Ranch. After completion of the Community Center Project, the City at its expense shall maintain, repair and replace all fencing along the boundary between the Community Center Property and the Wulfsohn Ranch, unless damage is caused by ranching operations of GM, its tenants or lessees on the Wulfsohn Ranch.

8. Modifications of Community Center Project Plans and Specifications. In the event the City desires to subsequently modify the Community Center Project Plans and Specifications, as defined and limited in Paragraphs 3, 4 and 5 above, from the Community Center Project Plans and Specifications, the City shall forward the proposed modifications to GM, which shall approve or disapprove the proposed modifications, and GM's approval shall not be unreasonably withheld. In the event GM disapproves the proposed modifications, the City Engineer (and/or consulting engineers) shall meet with GM representatives and GM's engineer to formulate alternatives necessary to implement this Agreement and complete the Community Center Project. The parties agree that time is of the essence to secure agreement upon any modifications to the Community Center Project Plans and Specifications. Notwithstanding the foregoing, in the event the City and GM cannot agree, the City shall construct the Community Center Project pursuant to the original Community Center Project Plans and Specifications.

9. Inspections. GM shall have the right to undertake such inspections of the Community Center Project as GM deems appropriate at any time prior to, during, or after completion of the same; provided, however, that such inspections shall be limited to GM's interest in the Community Center Project as set forth in Paragraphs 3, 4 and 5, above. Further, the City agrees to provide GM's planners and engineers seven (7) days' written notice prior to the commencement of any work on or within the Atkinson Canal easement and Pump Station easement reserved by GM. The City shall not cover or bury any portion of culvert installed for the Atkinson Canal until it has provided GM and GM's planners and engineers forty-eight (48) hours' notice and the opportunity to inspect and approve the facilities. If GM fails to respond within 48 hours notice the City provides prior to burying or covering facilities, the City shall be entitled to treat such non-response as approval and proceed to cover or bury the culverts or facilities.

10. Nonconforming Work. In the event the City completes or constructs the Community Center Project, as defined in Paragraph 6, above, contrary in a material manner to the Community Center Project Plans and Specifications and any modifications approved pursuant to Paragraph 8, above, or fails to complete the Community Center Project, which installation or failure adversely affects GM's interest as determined by GM in its reasonable discretion, the City, at its sole expense, shall upon demand by GM undertake all work required to bring the Community Center Project into conformance with the Community Center Project Plans and Specifications. GM shall be entitled to enforce this right by an action at law or equity, including an action for specific performance.

11. Midland Extension Access Points.

A. Farm Access. The City has provided to GM (through that certain Midland Avenue Right of Way Extension Acquisition Agreement dated September 20, 1994) three access points for use by GM in connection with its farming and ranching and future development operations on the Wulfsohn Ranch. The City agrees that none of these three access points is to be considered as used for access to the Community Center Property. For these purposes, the City shall install one (1) new access point within the boundary of the Community Center Property (located east of the existing farm access point). The City hereby grants GM the right to utilize such access point for the stated purposes of using, maintaining,

repairing, replacing and operating the Atkinson Canal, the GM Water Rights and the Pump Station; provided, however, in the event of any such use by GM, GM shall be responsible for cleaning and removing any debris, mud or other substance arising from GM's use, maintenance, repair, replacement or operation of the Atkinson Canal, Water Rights or Pump Station. Any debris or trash removed from the Atkinson Canal or Pump Station by GM shall not be placed adjacent to the Atkinson Canal or elsewhere on the Community Center Property, but shall be, at GM's sole cost, immediately removed and properly disposed of. GM shall give the City at least 48 hours prior notice of GM's intent to access any part of the Community Center Property for the purposes set forth herein

B. Development Access Points. The City agrees to continue to provide to GM three access points from the Midland Extension Right-of-Way onto the Wulfsohn Ranch property at such time as GM desires to develop the Wulfsohn Ranch property. One access point shall be for the north outparcel created on the west end of the Wulfsohn Ranch as a result of the Midland Extension Project. Two access points shall be for the developable portions of the Wulfsohn Ranch property located south of the Midland Extension Right-of-Way Parcel and West and South of the Community Center Property. The actual location and design of such access points shall be subject to engineering considerations and approval of the City, which approval shall not be unreasonably withheld. Such accesses shall be constructed to agreed upon specifications at GM's sole expense; provided, however, the City shall not, as a condition of granting such accesses, require GM to pay the City any consideration whatsoever. This Agreement is not intended to alter or otherwise affect the existing agreements between the parties hereto with respect to these matters.

C. Community Center Access Point and Road. The City agrees that GM shall have the right to utilize the Road to be developed as part of the Community Center Project and that GM may incorporate such Road in its development plans for the remainder of the Wulfsohn Ranch.

12. Pump Station Relocation. As a result of the City's acquisition of the Community Center Property and the construction of the Community Center Project, GM will be required to relocate its existing pump station serving the Atkinson Canal and situated on the Community Center Property, located generally in the south-eastern portion of the Wulfsohn Ranch. In the event that after said five (5) year period, said Pump Station is still reasonably necessary for the irrigation of the remainder of the Wulfsohn Ranch or for the raw water irrigation of any development approved by the City, GM shall undertake the relocation of the Pump Station no later than five (5) years after the date of this Agreement. The City agrees to reimburse GM the reasonable costs of such relocation, which costs shall in no event exceed \$20,000.00. The City also agrees to extend electrical service to the relocated Pump Station at the City's sole cost at the time relocation is undertaken. GM agrees to convey to the City a non-exclusive easement, not to exceed fifteen feet (15') in width, for installation, maintenance, operation, repair and replacement of the electric facilities. The easement shall be in a location mutually agreed upon by the parties. Until such time as GM



shall re-locate its Pump Station, it shall have the easement rights described hereinabove from the City reasonably necessary to maintain and use the Pump Station as it is presently situated.

13. Atkinson Canal Crossings. The City shall as part of the Community Center Project, and at its expense, install those crossings and culverts for the portion of Atkinson Canal and its lateral ditches affected by the Community Center Project development and in accordance with the Community Center Project Plans and Specifications.

14. Completion; Conveyance of GM Facilities. Upon completion of the Community Center Project, the City Engineer shall furnish GM with written certification that the Atkinson Canal crossings, culverts and appurtenant facilities, Pump Station, access road, and utility sleeves were completed in substantial conformance with the Community Center Project Plans and Specifications, and any approved modifications and change orders. Upon such receipt, GM shall then provide the City written notification of its acceptance of the Atkinson Canal crossings, culverts, Pump Station, and appurtenant facilities, which date shall be known as the Acceptance Date. Within thirty (30) days of the Acceptance Date, the City shall execute a bill of sale conveying to GM, free and clear of all liens and encumbrances, the Atkinson Canal culverts and other facilities which the parties mutually agree shall be conveyed to GM. The City shall also provide GM with lien waivers for all property conveyed from all contractors, subcontractors, and material suppliers. Once conveyed to GM, subject to the warranty provisions of Paragraph 15, below, GM shall be solely responsible for operation, maintenance, repair, and replacement of Atkinson Canal culverts and appurtenant facilities.

15. Warranty. The City shall warrant all facilities which are conveyed to GM pursuant to this Agreement for a period of one (1) year from the Acceptance Date. Specifically, but not by way of limitation, the City shall warrant that any and all facilities conveyed to GM shall be free of any defects in materials or workmanship for a period of one (1) year.

16. Drainage and Tailwater. GM shall have the right to continue irrigation of the retained portions of the Wulfsohn Ranch. The Community Center Project shall include adequate facilities and/or provisions for disposal of tailwater and water seepage from the Atkinson Canal, the Pump Station and any lateral ditch structures. To the extent the Community Center Project creates any alteration of historical drainage patterns which result in disputes with or claims by down-gradient drainage recipients, the City hereby acknowledges that it shall at its expense be solely responsible for resolving such disputes or claims, and that it shall indemnify GM as provided in Paragraph 18, below.

17. Scope. This Agreement applies only to GM's acquisition of the Salt Plant Property and the City's acquisition and development of the Community Center Property and the Community Center Project upon GM's Wulfsohn Ranch. The terms hereof shall not extend to, nor shall they be construed in any manner to extend to or be a precedential effect, with regard to any other improvements to any other portion of the Atkinson Canal or other property interests of GM. The parties expressly agree that any compensation paid or consideration given pursuant to this Agreement shall be of no precedential or evidentiary value in any future proceedings between the parties hereto, specifically including any eminent domain proceeding between the parties.

18. Indemnity. To the extent permitted by law, and limited in duration to applicable statutes of limitation, the City shall indemnify and hold GM, its parent, subsidiary, and/or affiliate

companies and the respective directors, officers, agents, and employees thereof, free and harmless from and against any and all liabilities, suits, claims, actions, proceedings, judgments, decrees, settlements, demands, and causes of action of all kinds, including but not limited to claims of damages to or losses of property of GM or others, injury, illness, or death, attorneys' fees and costs which arise from or in any manner relate to:

- A. The City's ownership of the Salt Plant;
- B. Work performed, facilities installed, or materials provided by the City, its contractors, subcontractors, materialmen, or others in connection with the City's prior ownership of the Salt Plant Property or the City's future work on or development of the Community Center Project and appurtenant facilities.
- C. Damages of any type claimed by any landowner, tenant, or other person located downstream or downgradient of the Wulfsohn Ranch or Atkinson Canal which arise from or relate to the City's work on or development of the Community Center Project and appurtenant facilities.
- D. Damages of any type claimed by any landowner, tenant, or other person located downstream of the Atkinson Canal or otherwise which are caused by the City's work on or installation of the Community Center Project.
- E. The City's use of any part of the Wulfsohn Ranch or any activity done or permitted by the City.
- E. Any breach by the City of its obligations under this Agreement.
- F. Any act or omission of the City, its agents, contractors, employees, or employees taken pursuant to this Agreement or upon the Wulfsohn Ranch.

The City shall be solely responsible to defend any such action, proceeding, or claim for which GM may be entitled to indemnification, and GM hereby agrees to fully cooperate with the City in the defense or settlement, as the case may be, of such action, proceeding, or claim, but GM reserves the right to participate in the defense or any such action, proceeding, or claim at its own expense. The City shall give written notice to GM within ten (10) days after the City's actual knowledge of any matter giving rise to the obligation contained in this Paragraph. No insurance requirements shall be construed to limit this indemnity, which shall be effective to the maximum extent permitted by applicable law. As between GM and the City, the City hereby expressly waives any defenses of governmental immunity as provided in C.R.S. section 24-10-101 et seq., as necessary to effectuate this indemnity; except, however, that the City expressly reserves all rights to assert governmental immunity with regard to any claims of third parties against the City.

19. Amendment. Any modification or amendment hereto shall be evidenced by a writing

signed by the parties.

20. Binding Effect; Survival. This Agreement shall be binding upon and inure to the benefit of the parties, their successors, grantees, and assigns. Each term and condition of this Agreement shall survive the closing on the Community Center Property and the Salt Plant Property.

21. Authority. Each person executing this Agreement represents and warrants that he has been duly authorized by the party that he purports to represent to execute this Agreement, and has authority to bind said party to the terms and conditions of this Agreement.

22. Governing Law. This Agreement shall be construed under the laws of the State of Colorado.

23. No Waiver. No provision of this Agreement may be waived except by an agreement in writing signed by the waiving party. A waiver of any term or provision shall not be construed as a waiver of any other term or provision.

24. Headings. The paragraph headings in this Agreement shall not be used in the construction or interpretation hereof, as they have no substantive effect and are for convenience only.

25. Severability. If any part or section of this Agreement shall be found void or invalid by court of competent jurisdiction, such finding shall not affect any remaining part or section, and said remaining parts or sections shall continue in full force and effect. The parties shall renegotiate in good faith any matter addressed by a part or section that is found void or invalid.

26. Notice. All notices required under this Agreement shall be in writing and shall be hand delivered, sent by facsimile or sent by registered or certified mail, return receipt requested, postage prepaid, to the addresses of the parties herein set forth. All notices so given shall be considered effective seventy-two (72) hours after deposit postage paid in the United States Mail with the proper address as set forth below. Either party by notice so given may change the address to which future notices shall be sent.

Notice to:

Glenwood Meadows, LLC  
c/o Robert Macgregor  
525 East Cooper Avenue  
Aspen, CO 81611  
(970) 925-9046 Telephone  
(970) 925-9076 Facsimile

With copy to:

Thomas J. Hartert  
802 Grand Avenue, Suite 303  
Glenwood Springs, CO 81601  
(970) 928-7803 Telephone  
(970) 928-7805 Facsimile

Notice to:

City of Glenwood Springs  
attn: City Manager  
attn: City Attorney  
806 Cooper Avenue  
Glenwood Springs, CO 81601  
(970) 945-2575 Telephone  
(970) 945-2597 Facsimile

27. Signatures: Counterparts. GM and the City agree that signatures obtained by facsimile transmission shall be sufficient and binding for purposes of this Agreement, and that original signatures shall be forwarded to each party. This Agreement may be executed in multiple original counterparts, each of which shall constitute an original but all of which shall constitute one and the same document.

IN WITNESS WHEREOF, the parties have executed this Acquisition and Exchange Agreement in duplicate originals on the day and year first written above.

CITY OF GLENWOOD SPRINGS

By:

Name: Sam Skramstead, Mayor

GLENWOOD MEADOWS, LLC,  
a Colorado Limited Liability Company  
By: Dunrene Management, Inc., its Manager

By:

Name: Robert Duncan Macgregor

Title: President of Dunrene Management, Inc.

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4 of 5 R 26.00 D 0.00 GARFIELD COUNTY CO

UNION PACIFIC RAILROAD COMPANY  
Glenwood Springs, Garfield County, Colorado

EXHIBIT "A"

A parcel of land situated in Section 9, Township 6 South, Range 89 West of the Sixth Principal Meridian, City of Glenwood Springs, County of Garfield, State of Colorado, said parcel being more particularly described as follows:

BEGINNING at a point on the southerly right of way line of Colorado State Highway 6 & 24, being also a point on the Denver and Rio Grande Western Railroad, predecessor to Union Pacific Railroad Company right of way, Whence the North 1/4 corner of said Section 9, a BLM 3" diameter Aluminum Cap dated 1995 bears N 89° 24' 43" E a distance of 1341.69 feet;

Thence along said Northerly right of way line of said railroad the following three (3) courses: S 02° 22' 04" W a distance of 219.71 feet; Thence S 43° 27' 33" E a distance of 478.33 feet; Thence 264.08 feet along the arc of a non-tangent curve to the left having a central angle of 19° 34' 36", a radius of 772.90 feet, and a chord that bears S 80° 14' 57" E a distance of 262.80 feet to a point on the Westerly line of Access Road M (CDOT Project I 70-(8) 113 Sec. 2); Thence along the Westerly right of way of said Access Road M the following two (2) courses; 61.44 feet along the arc of a curve to the left having a central angle of 04° 32' 08", a radius of 776.20 feet, and a chord that bears S 48° 53' 05" W a distance of 61.43 feet; Thence S 46° 37' 00" W a distance of 148.59 feet to a point on the Northerly right of way of Interstate 70; Thence along said Northerly right of way the following two (2) courses; N 43° 23' 00" W a distance of 623.75 feet; Thence 726.10 feet along the arc of a curve to the right having a central angle of 07° 23' 24", a radius of 5629.60 feet and a chord that bears N 39° 41' 18" W a distance of 725.60 feet to a point on the southerly right of way of Colorado State Highway 6 & 24; Thence along said Southerly highway right of way the following four (4) courses: 192.79 feet along a non-tangent curve to the left having a central angle of 18° 19' 07", a radius of 603.00 feet, a chord that bears S 51° 11' 28" E a distance of 191.97 feet; Thence S 60° 21' 00" E a distance of 42.30 feet; Thence 241.17 feet along the arc of a curve to the left having a central angle of 11° 45' 00", a radius of 1176.00 feet, and a chord that bears S 66° 13' 30" E a distance of 240.75 feet; Thence S 72° 06' 00" E a distance of 64.22 feet to the Point of Beginning.

Containing 2.56 acres more or less

Office of Real Estate  
Omaha, Nebraska  
July 9, 1998

Written by: JCO  
167367.leg

EXHIBIT

A



## SCHEDULE A

## PROPERTY DESCRIPTION

ORDER NO: 95024044

## PARCEL A

A tract of land in Lot 6 of Section 9, Township 6 South, Range 89 West, 6th P.M., consisting of those parts of said Lot 6 described in a Document recorded in the office of the Clerk and Recorder of said County, in Book 356 at Page 401 thereof, excepting that parcel of said Lot 6 described in a Document recorded in said office in Book 381 at Page 42 thereof, said tract of land being more particularly described as follows:

Beginning at a point, which is the point of intersection of the Southerly right-of-way line of U.S. Highway 6 & 24 and the Westerly right-of-way line of Devereux Road in Glenwood Springs Colorado, thence the North Quarter Corner of said Section 9 bears N. 46 degrees 05'57" E. 62.73 feet;  
 thence along said Southerly right-of-way of U.S. Highway 6 & 24 N. 64 degrees 58'30" W. 229.60 feet;  
 thence along the arc of a curve to the right having a radius of 985.00 feet and a central angle of 86 degrees 28'59" for a distance of 111.45 feet, the chord of said curve bears N. 61 degrees 44'00" W. 111.39 feet;  
 thence leaving said highway right-of-way S. 00 degrees 38'41" W. 335.51 feet to a point on the Westerly right-of-way line of said Devereux Road;  
 thence along said Westerly right-of-way line N. 50 degrees 47'52" E. 2.31 feet;  
 thence along the arc of a curve to the right having a radius of 776.20 feet and a central angle of 14 degrees 56'45" for a distance of 202.47 feet, the chord of said curve bears N. 59 degrees 22'37" E. 201.90 feet;  
 thence N. 66 degrees 51'00" E. 100.60 feet;  
 thence along the arc of a curve to the left having a radius of 79.70 feet and a central angle of 41 degrees 49'40" for a distance of 58.18 feet, the chord of said curve bears N. 45 degrees 56'10" E. 56.90 feet;  
 thence N. 25 degrees 01'20" E. 2.41 feet more or less to the Point of Beginning.

COUNTY OF GARFIELD  
 STATE OF COLORADO

## PARCEL B

All of the Northerly portion of the W1/2 of Lot 6, Section 9, Township 6 South, Range 89 West of the Sixth Principal Meridian, situate between the Southerly right of way line of the State Highway and the Northerly right of way line of the Denver and Rio Grande Western Railroad Co., and Northerly of the Northerly right of way line of I-70, EXCEPT that portion thereof described in Book 61 at Page 49 thereof, as Document No. 27620; and EXCEPT that portion thereof described in Book 61 at Page 534 thereof, as Document No. 29570, in the County of Garfield, State of Colorado.

COUNTY OF GARFIELD  
 STATE OF COLORADO

EXHIBIT "A"

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Any and all water and water rights, ditches and ditch rights, well and well rights, appurtenant to or historically used upon or in connection with that the real property described in Exhibit A-1 including but not limited to .3 cfs from the Oasis Ditch.

(Conveyed to Glenwood Springs Salt Company, L.P. by Donald Megaard and Lila M. Megaard by Quit Claim Deed dated February 5, 1990, Recorded February 5, 1990 in Book 772 at Page 323, Reception No. 409685.)

All of grantor's interest, if any, in and to ditch, ditch rights, water and water rights used upon or in connection with the real property described as:

All of the Northerly portion of the W $\frac{1}{4}$  of Lot 6, Section 9, Township 6 South, Range 89 West of the Sixth Principal Meridian, situate between the Southerly right of way line of the State Highway and the Northerly right of way line of the Denver and Rio Grande Western Railroad Co., and Northerly of the Northerly right of way line of I-70, EXCEPT that portion thereof described in Book 61 at Page 49 thereof, as Document No. 27620; and except that portion thereof described in Book 61 at Page 534 thereof, as Document No. 29570, in the County of Garfield, State of Colorado.

SUBJECT TO a thirty (30) foot wide easement and right of way for ingress and egress, utilities and drainage, as described hereinbelow:

An Ingress and Egress easement situate in Lot 6, Section 9, Township 6 South, Range 89 West of the 6th P.M. being 30 feet in width and lying 15 feet on each side of the following described centerline:

Beginning at a point on the southerly right-of-way line of U.S. Highway 5 & 24 whence the N $\frac{1}{4}$  corner of said section 9 bears  
N74° 28' 45"E 862.79 feet, thence  
N76° 20' 15"W 204.92 feet, thence  
N66° 02' 57"W 342.34 feet more or less to the easterly line of lands owned by the Denver and Rio Grande Western R. R., the point of ending, whence said N $\frac{1}{4}$  corner bears N87° 51'03"E 1345.83 feet.

COUNTY OF GARFIELD  
STATE OF COLORADO

(As conveyed to Glenwood Springs Salt Company, L.P. by Ray Fender by Warranty Deed dated March 1, 1990, recorded March 1, 1990 in Book 773, at Page 714, Reception No. 413323)

543583 04/08/1999 02:50P B1123 P719 N ALSDORF  
14 of 14 R 71.00 D 0.00 GARFIELD COUNTY CO

EXHIBIT "E"

DESCRIPTION-EXEMPTION PARCEL

A tract of land situate in the NE 1/4 of Section 8 and the NW 1/4 of Section 9, all in Township 6 South, Range 89 West of the 6th Principal Meridian being more particularly described as follows:

Beginning at a point whence the southeast corner of the SW 1/4 of the NW 1/4 of said Section 9 bears S 59°45'07" E 2360.09 feet; thence N 62°49'19" E 880.27 feet to the westerly right of way line of Midland Avenue; thence along the westerly right of way line of Midland Avenue the following courses: S 21°43'32" E 69.75 feet; thence 272.23 feet along the arc of a curve to the left, having a radius of 1165.00 feet, a central angle of 13°23'19", and subtending a chord bearing S 28°25'10" E 271.61 feet; thence S 35°06'49" E 21.42 feet; thence S 54°53'11" W 22.69 feet; thence S 41°40'06" E 43.30 feet; thence N 54°53'11" E 17.75 feet; thence S 30°38'49" E 271.57 feet; thence S 41°04'38" E 291.31 feet; thence S 23°28'47" E 143.44 feet; thence 95.89 feet along the arc of a curve to the left, having a radius of 100.00 feet, a central angle of 54°56'35", and subtending a chord bearing S 50°57'06" E 92.26 feet; thence S 17°34'08" W 81.64 feet; thence S 12°15'32" E 109.78 feet; thence S 19°54'08" E 208.92 feet; thence S 50°07'49" E 109.72 feet; thence S 33°57'41" E 159.48 feet to the south line of the NW 1/4 of said Section 9 whence the southeast corner of the SW 1/4 of the NW 1/4 of said Section 9 bears S 88°48'57" E 361.88 feet; thence N 88°48'57" W 956.62 feet along the south line of said SW 1/4 of the NW 1/4 of Section 9; thence N 89°15'16" W 378.91 feet along the south line of the SE 1/4 of the NE 1/4 of said Section 8; thence N 16°27'24" W 1206.11 feet to the point of beginning, containing 36.013 acres more or less.

The name and address of the person who prepared the above legal description is Kenneth R. Wilson, Surveyor, Schmeiser Gordon Meyer, Inc., 118 West 6th Street, Suite 200, Glenwood Springs, Colorado 81601.

Kenneth R. Wilson

Date

**WEST GLENWOOD SPRINGS SANITATION DISTRICT  
SPECIAL FEE AND COST REIMBURSEMENT AGREEMENT**

This Special Fee and Cost Reimbursement Agreement is entered into by and between the WEST GLENWOOD SPRINGS SANITATION DISTRICT, whose address is P. O. Box 866, Glenwood Springs, Colorado 81602 (hereinafter "District") and GLENWOOD MEADOWS, LLC, a Colorado limited liability company, whose address is 525 East Cooper Avenue, Aspen, Colorado 81611 (hereinafter "Glenwood Meadows" or "Applicant");

**WITNESSETH:**

WHEREAS, the District is a Colorado special district and quasi-municipal corporation formed and functioning under the authority of C.R.S. §32-1-101, *et seq.* and §31-35-401, *et seq.*, providing sanitary sewer service to the area around West Glenwood Springs, Colorado; and

WHEREAS, Glenwood Meadows is the owner of that certain real property described in Exhibit A, attached hereto and incorporated herein by this reference (the "Property"), and desires to undertake the projects or activities described in Paragraph 1, below; and

WHEREAS, the above activity or project will require the District to provide the special services and incur the costs set forth in Paragraph 2, below; and

WHEREAS, pursuant to C.R.S. §§32-1-1001(1)(d), (j-m) and §31-35-402(1)(f), the District has the authority to require reimbursement of its out-of-pocket costs in providing services to District customers, including but not limited to sewer connections, inclusions and exclusions from the District, and planning and review of line extensions and connections; and

WHEREAS, Sections 5.01, 7.04, and 8.01 of the Rules and Regulations of the District provide that the District may charge legal, engineering, publication, recording, inspection, and other fees of customers desiring services from the District; and

WHEREAS, the special fees paid and collected by virtue of this Agreement shall be used solely to pay for the cost of planning, engineering review and inspection, legal review, administrative review, and actual out-of-pocket costs incurred by the District in relation to the anticipated project; and

WHEREAS, the Board of Directors of the District and Glenwood Meadows desire to set forth their agreements and understandings concerning this matter.

NOW, THEREFORE, in consideration of the mutual covenants and promises of the parties, and for other good and valuable consideration, the adequacy and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Glenwood Meadows desires to undertake the following projects or activities involving the District or its sewer systems:

☐ Inclusion into the District  
☐ Exclusion from the District  
☒ Sewer line connection  
☐ Other (describe) Special Tap Fee Agreement

2. The activity or project being undertaken by Glenwood Meadows will require the District to provide the following special services or incur the following costs:

☒ Engineering review and advice  
☒ Legal review and advice  
☒ Preparation of plats or plans  
☒ Inspections  
☒ Recording fees  
☒ Filing fees  
☐ Other (describe):

3. Glenwood Meadows agrees to pay the District in full for all special services provided or actual costs incurred by the District in relation to the project or activity described above on receipt of an itemized billing for those services from the District. All such amounts are due within thirty (30) days of the date of the bill, with interest on any overdue amounts to be assessed at one percent (1%) per month. In the event that such amounts remain unpaid thirty (30) days after the date they are billed, the District reserves the right to cease supplying any and all sewer services being provided, review and processing of applications for service, inclusion, exclusion, and line extension. In the event the District is forced to pursue collection of any amounts due and unpaid under this provision, it shall be entitled to collect attorneys fees, filing, and recording fees incurred in such collection efforts in addition to the unpaid amounts due, plus interest.

4. Glenwood Meadows agrees to provide a deposit to the District in the amount of One Thousand Dollars (\$1,000) at the time of signing this Agreement. The District shall not commence to provide any of the services desired by the Applicant, or advance any further costs, until this deposit is received by the District. Further, in the event it is deemed necessary to purchase an easement or condemn an easement, Glenwood Meadows shall supplement the initial deposit in an amount to be determined by the District to pay in advance the expected amounts for such service prior to the District undertaking such services. Any amount by which the Applicant's deposit exceeds the cost assessed under this section shall be refunded to the Applicant within a reasonable time after final action has been taken on the project or applied toward the tap fees to be due under a Tap Fee Agreement to be executed by the parties. Any amount by which the deposit is less than the total costs due to the District under this Agreement shall be due and payable subject to the provisions of Paragraph 2, above.



5. The District specifically does not agree to act favorably on any application to the District made by Glenwood Meadows in exchange for payment of the special fees set forth above.

6. This Agreement constitutes the entire and complete agreement of the parties on the subject matter herein. No promise or undertaking has been made by any party, and no understanding exists with respect to the transaction contemplated, except as expressly set forth herein. All prior and contemporaneous negotiations and understandings between the parties are embodied and merged into this Agreement.

7. This Agreement may be amended from time to time by amendments made by the parties in written form and executed in the same manner as this Agreement.

8. This Agreement shall be binding upon and inure to the benefit of the parties and their assigns and successors in interest.

9. The undersigned by their signatures hereto warrant that they are fully authorized to execute this Agreement in the name of the entity for which each of them sign.

10. If any covenant, term, condition, or provision under this Agreement shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such covenant, term, condition, or provision shall not affect any other provision contained herein.

11. The parties agree and intend that this Agreement shall run with the land described in Exhibit A, attached hereto, and be a burden upon that property until final payment has been made to the District of all fees due and payable under this Agreement, or until the earlier termination of this Agreement.

IN WITNESS WHEREOF, the parties have executed this SPECIAL FEE AND COST REIMBURSEMENT AGREEMENT on the day and year adjacent to their respective signatures.

WEST GLENWOOD SPRINGS  
SANITATION DISTRICT

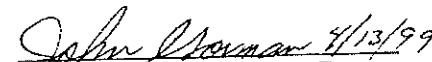
Date:

13 APRIL 99

By

  
Chairman

ATTEST

  
Secretary

4/13/99  
Date

GLENWOOD MEADOWS, LLC

By Dunrene Management Inc., Manager

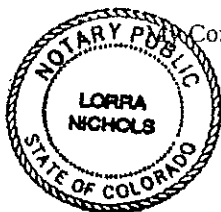
Date: \_\_\_\_\_

By [Signature]  
Robert Duncan Macgregor, President

STATE OF COLORADO )  
COUNTY OF Garfield ) ss.

Acknowledged, subscribed, and sworn to before me this 13th day of April, 1999; by Lee Enewold, as Chairman, and by John Gorman, as Secretary, on behalf of the West Glenwood Springs Sanitation District.

WITNESS my hand and official seal.



Commission expires: 6-28-99

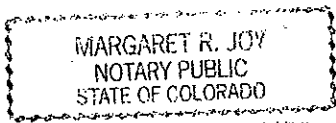
[Signature]  
Notary Public

STATE OF COLORADO )  
COUNTY OF Garfield ) ss.

Acknowledged, subscribed, and sworn to before me this 13th day of March, 1999, by Robert Duncan Macgregor, as President of Dunrene Management, Inc., on behalf of Glenwood Meadows, LLC.

WITNESS my hand and official seal.

My Commission expires: 12/31/2000



[Signature]  
Notary Public

EXHIBIT A

Glenwood Land Company Property:

A PARCEL OF LAND SITUATED IN SECTIONS 5 AND 6, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF GARFIELD, STATE OF COLORADO, SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A CONCRETE RIGHT-OF-WAY MONUMENT FOUND ON THE SOUTHERLY RIGHT-OF-WAY OF THE DENVER AND RIO GRANDE WESTERN RAILROAD WHENCE THE BLM ALUM. CAP IN PLACE AND PROPERLY MARKED FOR THE SOUTHWEST CORNER OF SAID SECTION 5 BEARS SOUTH  $23^{\circ}29'57''$  WEST 1196.71 FEET;  
THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING (3) COURSES:  
THENCE SOUTH  $83^{\circ}38'11''$  WEST 901.40 FEET;  
THENCE NORTH  $82^{\circ}19'49''$  WEST 103.10 FEET;  
THENCE SOUTH  $83^{\circ}37'11''$  WEST 7.05 FEET LEAVING SAID SOUTHERLY RIGHT-OF-WAY;  
THENCE ALONG THE NORTHERLY RIGHT-OF-WAY OF THE MIDLAND AVE. RIGHT-OF-WAY ACQUISITION THE FOLLOWING (8) COURSES:  
THENCE SOUTH  $42^{\circ}36'53''$  EAST 17.15 FEET;  
THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 710.00 FEET AND AN ARC LENGTH OF 677.30 FEET, THE CHORD OF WHICH BEARS SOUTH  $69^{\circ}56'35''$  EAST 651.91 FEET;  
THENCE NORTH  $82^{\circ}43'44''$  EAST 80.93 FEET;  
THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 500.00 FEET AND AN ARC LENGTH OF 194.98 FEET, THE CHORD OF WHICH BEARS NORTH  $71^{\circ}33'27''$  EAST 193.75 FEET;  
THENCE NORTH  $60^{\circ}23'10''$  EAST 185.42 FEET;  
THENCE NORTH  $56^{\circ}38'55''$  EAST 230.74 FEET;  
THENCE NORTH  $75^{\circ}17'22''$  EAST 201.74 FEET;  
THENCE NORTH  $06^{\circ}21'46''$  WEST 19.87 FEET LEAVING SAID NORTHERLY RIGHT-OF-WAY;  
THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING (3) COURSES:  
THENCE SOUTH  $83^{\circ}38'11''$  WEST 132.79 FEET;  
THENCE SOUTH  $86^{\circ}30'11''$  WEST 200.30 FEET;  
THENCE SOUTH  $83^{\circ}38'11''$  WEST 98.60 FEET TO THE POINT OF BEGINNING.

## LINE CONNECTION AGREEMENT

THIS LINE CONNECTION AGREEMENT is made and entered into this 31 day of March, 1999, by and between the WEST GLENWOOD SPRINGS SANITATION DISTRICT, a Colorado special district (hereinafter "District") and GLENWOOD MEADOWS, LLC, a Colorado limited liability company whose address is 525 East Cooper Avenue, Aspen, Colorado 81611 (hereinafter "Glenwood Meadows");

### WITNESSETH:

WHEREAS, the District provides sanitary sewer service to the area around West Glenwood Springs, Colorado; and

WHEREAS, Glenwood Meadows is the owner of that certain real property described in Exhibit A, attached hereto and incorporated herein by this reference (hereinafter "Property"); and

WHEREAS, the Property is proposed to be subdivided into two (2) parcels, and such proposal is currently under review by the City of Glenwood Springs, Colorado; and

WHEREAS, the District met and discussed the provision of District services to the Property, and said provision was conceptually approved by the Board of Directors for the District, subject to the terms and conditions of a Line Connection Agreement to be entered into between the parties; and

WHEREAS, Glenwood Meadows desires the District to provide sanitary sewer service to the Property, and Glenwood Meadows plans to do the excavations, constructions, installations, connections, and other work necessary to extend the sewer main lines to the Property in order to facilitate the provision of such service; and

WHEREAS, the District is willing to provide sanitary sewer service to the Property upon the terms and conditions set forth herein.

NOW, THEREFORE, for and in consideration of the mutual covenants and agreements of the parties, and other good and valuable consideration, the adequacy and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. Rules and Regulations. The Rules and Regulations of the District in effect on the date of execution of this Agreement (hereinafter the "Rules and Regulations") are hereby incorporated into this Agreement by reference. In particular, Articles VII and VIII of the Rules and Regulations apply to line extensions and line connections. The provisions of this Agreement are intended to comply with the Rules and Regulations, and to the extent that any provision or provisions do not comply, they shall be interpreted in a manner that brings them into compliance.

with the Rules and Regulations in effect at the time this Agreement was executed. All capitalized terms used herein shall have the meanings defined for each term in the District's Rules and Regulations in effect on the date of execution hereof, unless otherwise specifically defined herein.

2. Ratification of Prior Agreements. The parties hereto have previously entered into the following agreements:

- a. West Glenwood Springs Sanitation District Pre-Inclusion Agreement, which Agreement is recorded in the office of the Clerk and Recorder of Garfield County in Book 1009 at Page 139 as Reception No. 504575 (hereinafter "Pre-Inclusion Agreement").
- b. West Glenwood Springs Sanitation District Special Fee and Cost Reimbursement Agreement dated ~~March~~ April 13, 1999, which Agreement is recorded in the office of the Clerk and Recorder of Garfield County in Book 1131 at Page 228 as Reception No. 546011 (hereinafter "Special Fee Agreement").

The parties hereto ratify and affirm the foregoing agreements.

3. Facility to be Installed by Glenwood Meadows. Glenwood Meadows has submitted for District review a written application for sewer line connection to the Property, engineering designs, and preliminary cost estimates. Pursuant to the Rules and Regulations of the District, the District Engineer must approve the plans for the line connection in writing before work commences. All construction and installations pursuant to the plan submitted shall comply with the Rules and Regulations of the District, including the Technical Specifications and Procedures, and the written approval, including any conditions contained therein, the District Engineer, and any applicable federal, state, county, or local laws. Upon review and approval of the plans by the District, Glenwood Meadows shall commence construction of the sewer line connection, including installation of all internal sewer lines. While it is the policy of the District to extend all internal sewer lines to the end of the lot line, the parties agree to temporarily relieve Glenwood Meadows of this requirement because it is the owner of the lands to the east and south that would be served by such an extension. Glenwood Meadows agrees that at the time sewer service is requested either for the east parcel created by the currently-proposed subdivision or for any other application for service in which service to the end of such east parcel is required, which ever comes first, Glenwood Meadows, or its successor in interest in any parcel of land in which service to the end of the east parcel shall be required, shall be obligated, at its sole cost, to extend the line to the south and/or east end of the parcel, as necessary, to provide service to such other lands, utilizing the easements to be included on the final plat as more fully outlined in Paragraph 6, below.



The parties agree that Glenwood Meadows shall construct a sewer line from the northwest corner of the Property along the northern property line, terminating at the property line contiguous to the two (2) subdivided parcels. Upon request by the District, Glenwood Meadows, or its successor in interest in any parcel of land in which service to the end of the east parcel shall be required, shall be required to extend the sewer line, at its sole cost, to the edge of the property line along one of the easements described in Paragraph 6, below. Said line connection shall be constructed and installed according to the final plans as approved in writing by the District Engineer, and any changes in or deviations from the final plans shall be separately approved in writing by the District Engineer.

4. Connection of District Sewer Service to the Property. Glenwood Meadows agrees that at the time the District's sewer services are extended to the Property, Glenwood Meadows shall connect all improvements to the District's sewer system and pay all fees due for such connections. Pursuant to the District's Rules and Regulations, no District service shall be provided and no connection shall be made to the District sewer systems until an application for service has been made, the applicable tap fee has been paid, and a tap permit has been issued.

5. Observation of Construction. All construction and installation of facilities by Glenwood Meadows shall be subject to the District's right to observation, at Glenwood Meadows' sole expense, by the District Engineer or such other authorized representative of the District as the District Board shall designate. Such observation may occur at any point during or upon completion of construction and may occur at any time after facilities are operational at reasonable intervals as the District may request. Glenwood Meadows shall ensure that the construction and installation of facilities is in accordance with the Rules and Regulations of the District and all applicable federal, state, county, and local laws. The District Engineer may direct Glenwood Meadows, on behalf of the District, to correct any deficiencies in the construction and installation of facilities that are not constructed or installed in conformance with the plans as approved. Glenwood Meadows shall coordinate with the District Engineer the timing of the construction and installation of facilities to facilitate compliance observations by the District Engineer. Observation, acquiescence, and/or approval by any engineering inspector of the construction of physical facilities, at any particular time, shall not constitute the approval by the District of any phase of the construction of such improvements. Such approvals shall be made by the District only after completion of construction and in the manner hereinafter set forth.

6. Easements. The final plat for subdivision of the Property shall dedicate utility easements as hereafter approved by the District across the Property, which shall be particularly described on the final utility plan and/or final plat. In connection herewith, Glenwood Meadows agrees to dedicate said easements to the District on the final plat, free and clear of all liens and encumbrances which would interfere, as determined by the District, with the District's use of the easements. All easements to be dedicated shall be general utility easements of a width determined by the District. Further, Glenwood Meadows agrees to dedicate all other easements, as necessary, for access or completion of work on the Property and for future expansion of District services to properties located south of Midland Avenue. Easements twenty-five feet

(25') in width shall run from the existing sewer line on the northwest corner of the Property, along the northern edge of the Property to the easternmost point on the Property. Additionally, an easement shall run from the northern point of the Property along the property line contiguous to the two (2) subdivided parcels to the southern point of the Property.

7. Acceptance of Facilities By District: Warranty. Upon completion of construction, installation, and connection of all sewer line facilities by Glenwood Meadows on the Property, the District Engineer shall certify to the District Board that such facilities have been constructed and installed in accordance with the provisions of the Rules and Regulations and in accordance with the applicable provisions of federal, state, county, and local laws. Thereupon, Glenwood Meadows shall request the District to accept said facilities and shall provide the District with the following information:

- a. A written summary of the actual costs of all facilities to be dedicated to the District. In addition, a certification that all such costs of construction have been fully paid, and written waivers of the right to claim mechanic's liens by all contractors performing work on the Property;
- b. A deed, bill of sale, and/or such other evidence as is satisfactory to the District, granting the District an easement or fee ownership of all property required by the plans as approved to be dedicated to the District in conjunction with the line connection project, free and clear of all liens and encumbrances, in a format acceptable to the District;
- c. Glenwood Meadows shall submit to the District a video tape of the interiors of the extended sewer lines;
- d. As-built drawings for the project which have been prepared by a registered land surveyor at Glenwood Meadows' expense and which satisfy the requirements of the Rules and Regulations and Technical Specifications and Procedures of the District. The drawings shall consist of one set of reproducible mylars and an auto-cad disk. The District's written acceptance of the as-built drawings and video tape shall complete Glenwood Meadows' dedication to the District of the facilities required by the plans;
- e. A two-year warranty guaranteeing to the District that the facilities have been constructed in a good and workmanlike manner for a period of two (2) years from the date of acceptance of the facility by the District. Ninety (90) days prior to the expiration of said warranty, Glenwood Meadows shall submit to the District a current videotape of the interiors of the extended sewer lines and, at the sole discretion of the District Engineer, shall repair any deficiencies. The guarantee shall be in a format acceptable to the District and shall be secured, if required by the District, in a form of security acceptable to the District; and

- f. Compliance with all other provisions and requirements of this Agreement.

Upon satisfactory completion of the above requirements, the District shall formally accept the line connection project by a motion entered in the minutes of the Board of Directors and refund to Glenwood Meadows all deposits made pursuant to this Agreement and not already released. Such acceptance, if given, shall constitute dedication by Glenwood Meadows of such facilities to the District. The parties agree that the District is under no obligation to provide sewer service to Glenwood Meadows until acceptance and dedication.

8. Breach by Glenwood Meadows: District's Remedies. In the event of a breach of any of the terms and conditions of this Agreement by Glenwood Meadows, the District Board of Directors (hereinafter the "Board") shall be notified immediately, and the District may take such action as the District deems necessary to protect the public health, safety, and welfare; to protect lot buyers and builders; and to protect the users of District facilities from hardship. In addition to all other remedies available at law, the District may:

- a. Refuse to approve Glenwood Meadows' plans and specifications for, or construction or installation of, sewer facilities; provided, however, that this remedy shall not be available to the District until after the affidavit described in (b), below, has been recorded;
- b. Record with the County Clerk and Recorder an affidavit, approved in writing by the Board and signed by the Chairman of the Board or any Board member, stating that the terms and conditions of this Agreement have been breached by Glenwood Meadows. At the next regularly scheduled Board meeting, the Board shall either approve the filing of said affidavit or direct a District representative to file an affidavit stating that the default has been cured. Upon the recording of such an affidavit, no further District services or assistance will be provided in connection with the Property until the default has been cured; an affidavit signed by the Chairman of the Board or any Board member and approved by the Board stating that the default has been cured shall remove this restriction;
- c. Demand that the security given for the completion of the improvements, if any, be paid or honored; and/or
- d. Refuse to provide services to the Property.

Unless necessary to protect the immediate health, safety, and welfare of the District users, the District shall provide Glenwood Meadows ten (10) days' written notice of its intent to take any action under this paragraph during which ten-day period Glenwood Meadows may cure the breach described in said notice and prevent further action by the District. Furthermore, unless an affidavit as described in (b), above, has been recorded with the Garfield County Clerk and Recorder, any person dealing with Glenwood Meadows shall be entitled to assume that no default by Glenwood Meadows has occurred hereunder unless a notice of default has been served

upon Glenwood Meadows as described above, in which event Glenwood Meadows shall be expressly responsible for informing any such third party of the District's claim of default.

9. Fees and Charges. Glenwood Meadows shall pay in full to the District all fees incurred by the District relating to the Glenwood Meadows' construction, installation, and connection of sewer lines on the Property, including engineering, surveying, legal, inspection, filing, or recording fees and related expenses.

10. Deposit. Because Glenwood Meadows has not received final plat approval, Glenwood Meadows has not posted or provided to the City of Glenwood Springs any performance guarantee for the completion of public improvements, and the parties acknowledge that Glenwood Meadows is proceeding at its own risk regarding the installation of the sewer utilities contemplated under this Agreement. In order to ensure that satisfactory as-built drawings for the project are submitted to the District as required by Section 7.05 of the Rules and Regulations, Glenwood Meadows shall deposit with the District One Thousand Dollars (\$1,000.00) in cash upon execution of this Agreement. Said deposit shall not be released back to Glenwood Meadows until satisfactory as-built drawings are submitted by Glenwood Meadows and approved in writing by the District Engineer.

11. Assignment. This Agreement may not be assigned by Glenwood Meadows without the prior written consent of the District, which consent shall not be unreasonably withheld. In the event Glenwood Meadows desires to assign its rights and obligations herein, it shall so notify the District in writing together with the proposed assignee's written agreement to be bound by the terms and conditions contained herein.

12. Indemnification. Glenwood Meadows agrees to indemnify and hold the District harmless from any and all claims or losses of any nature whatsoever resulting from Glenwood Meadows' construction and/or installation of improvements on the Property, for the dedication of easements to the District, and for any reimbursement agreements as stated or referred to herein. This indemnification shall include actual attorneys' fees incurred in the event that any party brings an action against the District for any of the approvals or dedications described herein. The parties hereto intend not to duplicate any legal services or other costs associated with the defense of any claims against either party described in this section. Thus, the parties hereto agree to cooperate in full to prevent duplicative expenses incurred as a result of the indemnification herein described.

13. Notice. This Agreement shall constitute actual notice of the terms and conditions herein to any and all future users of District services on the Property and all owners, tenants, or other persons who occupy units or reside upon the Property.

14. Covenants in This Agreement. The parties agree and intend that this Agreement shall run with the property described in Exhibit A, attached hereto, and be a burden and covenant on that property.

15. Recordation. Upon execution of this Agreement, the District shall record the Agreement in the Office of the Clerk and Recorder, Garfield County, Colorado.

16. Waiver of Defects. In executing this Agreement, Glenwood Meadows waives all objections it may have concerning defects, if any, in the formalities whereby the Agreement is executed, concerning the power of the District to impose conditions on Glenwood Meadows as set forth herein, and concerning the procedure, substance, and form of the ordinances or resolutions adopting this Agreement.

17. Release of Liability. It is expressly understood that the District cannot be legally bound by the representations of any of its officers or agents or their designees except in accordance with the Rules and Regulations and local, state, and federal laws, and that when dealing with the District, Glenwood Meadows acts at its own risk as to any representation or undertaking by District officers or agents or their designees which is subsequently held unlawful by a court of law.

18. Captions. The captions in this Agreement are inserted only for the purpose of convenient reference and in no way define, limit, or prescribe the scope or intent of this Agreement or any part thereof.

19. Invalid Provisions. If any provision of this Agreement shall be determined to be void by any court of competent jurisdiction, then such determination shall not affect any other provision hereof, all of which other provisions shall remain in full force and effect, and such void provision shall be replaced with a valid provision which most closely sets forth the intentions of the parties. It is the intention of the parties that, if any provision of this Agreement is capable of two constructions, one of which would render the provision void and the other of which would render the provision valid, then the provision shall have the meaning which renders it valid.

20. Governing Law. The laws of the State of Colorado shall govern the validity, performance, and enforcement of this Agreement. Should either party institute legal suit or action for enforcement of any obligation contained herein, it is agreed that the venue of such suit or action shall be in Garfield County.

21. Complete Agreement. This Agreement constitutes the entire and complete agreement of the parties on the installation by Glenwood Meadows of all internal sewer lines on the Property. No promise or undertaking has been made by any party, and no understanding exists with respect to the transaction herein contemplated, except as expressly set forth herein. All prior and contemporaneous negotiations and understandings between the parties are embodied and merged into this Agreement. Any modification or amendment must be in a written form and executed in the same manner as this Agreement.

22. Attorney Fees, Costs. In the event that either party deems it necessary to pursue litigation to enforce any provision of this Agreement, the prevailing party shall be entitled to



reasonable attorney fees and costs of suit actually incurred in such litigation.

23. Binding. This Agreement shall be binding upon and inure to the benefit of the parties and their assigns and successors in interest.

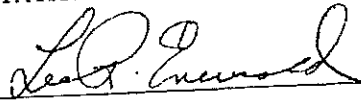
24. Counterparts. This Line Connection Agreement may be executed in duplicate original counterparts, each of which shall constitute an original, but all of which shall constitute one and the same document.

25. Notices. All notices, requests, demands, consents, and other communications pertaining to this Agreement shall be transmitted in writing and shall be deemed duly given when received by the parties at their addresses below or any subsequent addresses provided to the other party in writing.

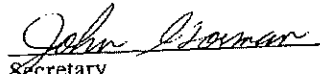
|                          |                                                                                                      |
|--------------------------|------------------------------------------------------------------------------------------------------|
| Notice to Glenwood Land: | Robert Duncan Macgregor<br>Glenwood Meadows, LLC.<br>535 East Cooper Avenue<br>Aspen, Colorado 81611 |
| With copy to:            | Thomas J. Hartert<br>802 Grand Avenue, Suite #303<br>Glenwood Springs, CO 81601                      |
| Notice to District:      | West Glenwood Springs Sanitation District<br>P.O. Box 866<br>Glenwood Springs, Colorado 81602        |
| With copy to:            | Leavenworth & Tester, P.C.<br>P. O. Drawer 2030<br>Glenwood Springs, Colorado 81602                  |

IN WITNESS WHEREOF, the District and Glenwood Land have caused this Line Connection Agreement to be executed on the day and year first above written.

WEST GLENWOOD SPRINGS  
SANITATION DISTRICT

By   
Chairman

ATTEST:

  
Secretary

GLENWOOD MEADOWS, LLC

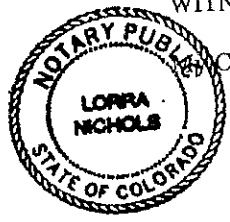
By Dunrene Management Inc., a Colorado corp., Manager

By [Signature]  
Robert Duncan Macgregor, President

STATE OF COLORADO )  
COUNTY OF Garfield ) ss.

Acknowledged, subscribed, and sworn to before me this 31<sup>st</sup> day of March, 1999, by Lee Enewold, as Chairman, and by John Gorman, as Secretary, on behalf of the West Glenwood Sanitation District.

WITNESS my hand and official seal.



Commission expires: 6-28-99

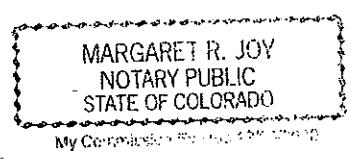
[Signature]  
Notary Public

STATE OF COLORADO )  
COUNTY OF Garfield ) ss.

Acknowledged, subscribed, and sworn to before me this 31<sup>st</sup> day of March, 1999, by Robert Duncan Macgregor, as President of Dunrene Management Inc., on behalf of Glenwood Meadows, LLC.

WITNESS my hand and official seal.

My Commission expires: 10/23/2001



[Signature]  
Notary Public

EXHIBIT A

Glenwood Land Company Property:

A PARCEL OF LAND SITUATED IN SECTIONS 5 AND 6, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF GARFIELD, STATE OF COLORADO, SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A CONCRETE RIGHT-OF-WAY MONUMENT FOUND ON THE SOUTHERLY RIGHT-OF-WAY OF THE DENVER AND RIO GRANDE WESTERN RAILROAD WHENCE THE BLM ALUM. CAP IN PLACE AND PROPERLY MARKED FOR THE SOUTHWEST CORNER OF SAID SECTION 5 BEARS SOUTH  $23^{\circ}29'57''$  WEST 1196.71 FEET;  
THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING (3) COURSES:  
THENCE SOUTH  $83^{\circ}38'11''$  WEST 901.40 FEET;  
THENCE NORTH  $82^{\circ}19'49''$  WEST 103.10 FEET;  
THENCE SOUTH  $83^{\circ}37'11''$  WEST 7.05 FEET LEAVING SAID SOUTHERLY RIGHT-OF-WAY;  
THENCE ALONG THE NORTHERLY RIGHT-OF-WAY OF THE MIDLAND AVE. RIGHT-OF-WAY ACQUISITION THE FOLLOWING (8) COURSES:  
THENCE SOUTH  $42^{\circ}36'53''$  EAST 17.15 FEET;  
THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 710.00 FEET AND AN ARC LENGTH OF 677.30 FEET, THE CHORD OF WHICH BEARS SOUTH  $69^{\circ}56'35''$  EAST 651.91 FEET;  
THENCE NORTH  $82^{\circ}43'44''$  EAST 80.93 FEET;  
THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 500.00 FEET AND AN ARC LENGTH OF 194.98 FEET, THE CHORD OF WHICH BEARS NORTH  $71^{\circ}33'27''$  EAST 193.75 FEET;  
THENCE NORTH  $60^{\circ}23'10''$  EAST 185.42 FEET;  
THENCE NORTH  $56^{\circ}38'55''$  EAST 230.74 FEET;  
THENCE NORTH  $75^{\circ}17'22''$  EAST 201.74 FEET;  
THENCE NORTH  $06^{\circ}21'46''$  WEST 19.87 FEET LEAVING SAID NORTHERLY RIGHT-OF-WAY;  
THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING (3) COURSES:  
THENCE SOUTH  $83^{\circ}38'11''$  WEST 132.79 FEET;  
THENCE SOUTH  $86^{\circ}30'11''$  WEST 200.30 FEET;  
THENCE SOUTH  $83^{\circ}38'11''$  WEST 98.60 FEET TO THE POINT OF BEGINNING.

## EASEMENT

THIS EASEMENT, granted this 17 day of January, 2000, between GLENWOOD MEADOWS, LLC, a Colorado limited liability company whose legal address is 525 East Cooper, Aspen, County of Pitkin, State of Colorado 81611, the Grantor, and the CITY OF GLENWOOD SPRINGS, COLORADO, a Colorado home-rule municipality whose legal address is 806 Cooper Avenue, Glenwood Springs, County of Garfield, State of Colorado 81601, the Grantee.

WITNESSETH, that the Grantor, for and in consideration of the sum of Ten and No/100 U.S. Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does grant, bargain, sell, and convey, without warranty soever, to the Grantee a non-exclusive easement for the following purposes:

- (i) below ground utility installation, repair, replacement and maintenance of Grantee-owned services; specifically including the right to install line extensions of the Grantee's sewer and water systems as may be reasonably necessary to service the needs of the real property owned by both Grantor and Grantee and described hereinbelow;
- (ii) below ground utility installation, repair, replacement and maintenance of standard utilities reasonably necessary to service the needs of the real property owned by both Grantor and Grantee and described hereinbelow; specifically including the right to install natural gas, telephone, CATV, electric, fiberoptic and similar distribution, transmission and service lines;
- (iii) above ground debris flow mitigation and surface water drainage systems; and
- (iv) other reasonable utility purposes as may be agreed in writing by the parties hereto,

over and across the following described parcel of real property, owned as of the date hereof by Grantor, situate in the County of Garfield and State of Colorado to wit:

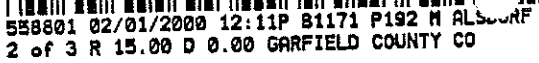
SEE EXHIBIT A, ATTACHED HERETO AND BY THIS  
REFERENCE, INCORPORATED HEREIN.

Provided, however, that the easement granted hereby may be relocated to other, contiguous real property owned by the Grantor upon the prior written agreement of the parties hereto. Upon such relocation, each party agrees to execute such instruments as shall be necessary to effect the release of the property described upon Exhibit A hereto from the tenure and encumbrance of the within easement.

This Easement is for the benefit of and appurtenant to that land, or any part thereof, situate in the County of Garfield and State of Colorado, and commonly known as the Wulfsohn Parcel as described by that certain Special warranty Deed conveying the same to Grantor dated September 6, 1996 and recorded in the Garfield County land records in Book \_\_\_ at Page \_\_\_. Grantee hereby covenants that it shall maintain the lands affected by Grantee's exercise of the easement rights granted hereunder, including any and all costs of mitigation, remediation, revegetation and landscaping. Grantee agrees to repair and maintain the easement granted herein at the cost and expense of the Grantee, and that said Grantee will in no way hinder or prevent the proper and reasonable use and enjoyment of Grantor's real property through which the easement is granted or contiguous thereto, including Grantor's unencumbered rights to ingress and egress.

This Easement is intended to be perpetual. In the exercise of the easement rights herein granted, Grantee may, at its own expense and with reasonable prior notice to Grantor, relocate existing fences and other removable above-ground fixtures which interfere with the efficient use of the easement.

173  
15



**GLENWOOD MEADOWS, LLC, a Colorado limited liability company** ✓

By: \_\_\_\_\_  
Name: Robert Duncan Macgregor  
Title: President of Dunrene Management, Inc., the Manager  
of Glenwood Meadows, LLC

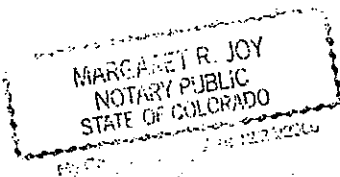
STATE OF COLORADO )  
COUNTY OF GARFIELD ) ss.

The foregoing instrument was acknowledged before me this 17<sup>th</sup> day of January, 2000, by Robert Duncan Macgregor, as the President of Dunrene Management, Inc., the Manager of Glenwood Meadows, LLC, a Colorado limited liability company.

Witness my hand and official seal.

*Margaret A. [Signature]*  
Notary Public  
0301

My commission expires: 12/31/2001





**EXHIBIT A**

A strip of land not to exceed thirty (30) feet in width, generally situate southerly of and contiguous to the Midland Avenue Alternate Route Right of Way as surveyed and in place. Said strip of land shall commence at the western boundary of that parcel of real property conveyed by Grantor to Grantee under that certain Correction Special Warranty Deed dated January 26, 2000, commonly known and referred to as the City of Glenwood Springs Community Center Site. Said strip of land shall then extend west to the eastern boundary of that parcel of real property conveyed by Grantor to Grantee under that certain Special Warranty Deed dated January 26, 2000, commonly known and referred to as the City of Glenwood Springs Municipal Operations Center Site. Intervening alterations, enlargements or deviations of the aforementioned Midland Avenue Alternate Route Right of Way which may exist between the point of beginning and the terminus of the strip of land described herein shall not have the corresponding effect of extending the easement granted herein further to the south of the general alignment of said Midland Avenue Alternate Route Right of Way.

## PUBLIC UTILITY EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that the undersigned, **GLENWOOD MEADOWS, LLC** (hereinafter called the "Grantor"), of the County of Garfield, State of Colorado, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby grant, bargain, and convey to the **CITY OF GLENWOOD SPRINGS, COLORADO**, a Municipal Corporation, whose address is 806 Cooper Avenue, Glenwood Springs, Colorado, 81601 (hereinafter called the "Grantee"), and its successors and assigns a non-exclusive public utility easement upon the lands of Grantor, situated in the County of Garfield, State of Colorado, said easement being more particularly described as follows:

A utility easement situated in Section 9, Township 6 South, Range 89 West of the 6th Principal Meridian, County of Garfield, State of Colorado, being 30 feet in width and lying 15 feet on each side of the following described centerline:

Beginning at a point whence the center west 1/16 corner of said Section 9 bears S 37°32'19" E, a distance of 1415.44 feet; thence S 51°26'25" E, a distance of 292.00 feet; thence S 52°58'53" E, a distance of 94.67 feet; thence 68.94 feet along the arc of a 419.58 feet radius curve to the right, having a central angle of 9°24'52" and subtending a chord bearing S 48°16'27" E, a distance of 68.86 feet; thence S 43°34'01" E, a distance of 500.94 feet; thence S 41°19'02" E, a distance of 250.17 feet to the point of ending; whence said center west 1/16 corner bears S 00°39'40" W, a distance of 286.68 feet.

Together with a temporary construction easement being 50 feet in width and lying 25 feet on each side of the above described easement centerline, said temporary easement will expire 1 Jan. 2002.

To construct, install, reconstruct, replace, repair, and maintain public utilities within the above described lands.

Together with the right to remove any and all fences and other structures, trees, bushes, vegetation within said easement when such is reasonably necessary for the exercise of the rights herein granted. After the exercise by Grantee of any of its rights hereunder, Grantee shall promptly restore the surface of the ground to its former condition as nearly as is practicable, at the sole expense of Grantee.

Neither the extent nor use of the easement granted herein shall be expanded or enlarged from its initial use without a specific written grant from Grantor for such expansion or enlargement.

Grantor agrees that all facilities installed by the Grantee within the easement shall remain the property of the Grantee and shall be removable at the option of the Grantee. In the event that the extent and use of this easement is abandoned or no longer used for the purpose described herein at any time hereafter for a period of one (1) year or more, the grant herein shall revert to the Grantor, its heirs, successors and assigns.

Except for the rights and privileges granted to the Grantee by this Agreement, the Grantor reserves the full, complete and uninterrupted right to use, possess and occupy all portions of the property encumbered by the easement granted herein, so long as such use, possession and occupancy does not unreasonably interfere with the purposes for which the easement is hereby granted.

TO HAVE AND TO HOLD, said permanent easement, unto Grantee, its successors and assigns, forever.

WITNESS the due execution hereof on Aug 8, 2000.

Grantor: **GLENWOOD MEADOWS, LLC**

STATE OF COLORADO )  
                                  )ss.  
COUNTY OF GARFIELD )

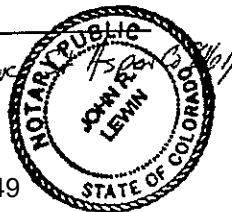
By [Signature] PRESIDENT BUSINESS MANAGEMENT  
MANAGER. INC.

The foregoing Easement Deed was acknowledged before me this 8 day of August, 2000, by \_\_\_\_\_ as \_\_\_\_\_ of **GLENWOOD MEADOWS, LLC**.

Witness my hand and official seal.

My commission expires: 5-12-02

Notary Public  
Address: 548 1/2 Spr



ANNEXATION AND DEVELOPMENT AGREEMENT (PRIVATE)  
GLENWOOD MEADOWS, LLC ANNEXATION

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THIS ANNEXATION AND DEVELOPMENT AGREEMENT ("Agreement") is made and entered into this 18 day of September, 2002, by and between the CITY OF GLENWOOD SPRINGS, COLORADO, a Colorado municipal corporation (hereinafter "City"), and GLENWOOD MEADOWS, LLC, a Colorado limited liability company, its successors, assigns, and its legal or other representatives (hereinafter collectively "Owner");

**WITNESSETH:**

WHEREAS, Owner owns approximately three hundred forty-five (345) acres of real property currently located in unincorporated Garfield County, Colorado, and more particularly described on Exhibit A, attached hereto and incorporated herein by this reference (hereinafter "Property"), which Property shall be known as "Glenwood Meadows"; and

WHEREAS, Owner and City entered into that certain Pre-Annexation Agreement concerning the Property dated August 20, 1999 and subsequently amended by instrument dated January 12, 2000 (as amended, the "PAA"); and

WHEREAS, in February, 2000, Owner filed with the City Clerk a petition and request for annexation of the Property into the City; and

WHEREAS, a duly noticed public hearing was held on March 2, 2000, whereat the City adopted a Resolution finding said petition and request to be in substantial compliance with the statutory requirements for annexation of the Property to the City; and

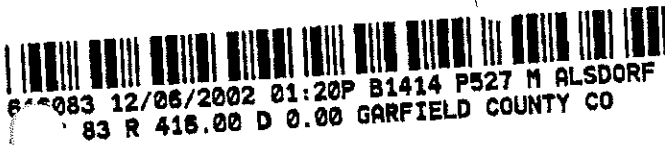
WHEREAS, Owner applied to the City for approval of certain Planned Unit Development zoning for the Property in March, 2000 (Zoning Application #42-99), which zoning application was subsequently withdrawn by Owner at a public hearing before the City Council on November 15, 2000; and

WHEREAS, upon the request of the City, approximately 4.63 acres of the Property was approved for annexation and zoning as C-1 Limited Commercial (the "MOC Entrance Parcel") and is subject a separate Annexation Agreement between the Owner and City; and

WHEREAS, on September 19, 2001 (Zoning Application #59-01) Owner submitted an application to the City for approval of a zoning plan for the Property which included C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial and R-3 Residential zoning districts for the portions of the Property not intended for public dedication (any portion of the Property intended for public dedication pursuant to this Agreement and the instruments incorporated herein may be zoned under the same application and review process as HP Hillside Preservation) as more fully described upon Exhibit B attached hereto and by this reference incorporated herein (the "Zoning Map"); and

WHEREAS, on March 21, 2002, the Owner did amend its original February, 2000 Annexation Petition to reflect the distinct characteristics of the Property subject to this Agreement and the MOC Entrance Parcel; and

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WHEREAS, on March 21, 2002 a Public Hearing was held pursuant to C.R.S. Section 31-12-109, as amended, at which public hearing it was determined that the annexation petition had satisfied all requirements of C.R.S. Section 31-12-101 et. Seq.; and

WHEREAS, on July 18, 2002 the City Council of the City of Glenwood Springs ("Council") did adopt Ordinance No. , Series of 2002, and Ordinance No. , Series of 2002, which respectively approved the Owner's petition and request for annexation of the Property and approved the Owner's application for municipal zoning of the Property; and

WHEREAS, during the public review of the annexation and zoning processes, the parties hereto have agreed to amend and eliminate the provisions of the prior PAA and to set forth and memorialize all agreements regarding the annexation, zoning and development of the Property in the instant Agreement; and

WHEREAS, the City and Owner desire to enter into this Agreement to set forth their agreements in writing concerning the terms and conditions of annexation of the Property to the City, the zoning of the Property under the City's Municipal Code and the adopted Zoning and Development Plan (Exhibit C attached hereto and by this reference incorporated herein), as well as the other conditions of the development of the Property as hereinafter described; and

WHEREAS, Owner intends to submit its development proposal to the City for subdivision review and approval and to construct the development in phases which correspond to the Zoning Plan parcels, it being understood that nothing herein shall confer upon Owner any other or further rights not expressly contained herein or by instruments incorporated herein.

**NOW, THEREFORE,** for and in consideration of the mutual promises and covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City and Owner agree as follows:

1. **Purpose.** The purpose of this Agreement is to set forth the terms and conditions of the annexation of the Property to the City, and the zoning and development of the Property in the City. Except as expressly provided for herein to the contrary, all conditions herein are in addition to any and all requirements concerning annexation and development contained in the Municipal Code of the City of Glenwood Springs, Colorado (hereinafter "Municipal Code"), the Municipal Annexation Act of 1965, as amended at C.R.S. §31-12-101 et seq., and other applicable laws.

Except as expressly provided herein to the contrary, the complete execution, delivery and recording of this Agreement shall render null and void the PAA between these same parties. Furthermore, and except as expressly stated otherwise herein, all terms and conditions of the following agreements, contracts and documents shall remain in full force and effect:

- (i) Midland Avenue Right Of Way Extension Agreement, dated September 20, 1994;
- (ii) Community Center Acquisition and Exchange Agreement, dated March 16, 1999;

- (iii) Municipal Operations Facility Site Acquisition Agreement, dated December 27, 1999
- (iv) MOC Water and Sewer Fee Credits Assignment and Bill of Sale, dated January 17, 2000;
- (v) MOC Entrance Parcel Annexation and Development Agreement.

2. Zoning Characteristics/Constraints/Requirements. The Zoning and Development Plan attached hereto as Exhibit C (the "Plan") shall govern the development of the Property. Any and all future site planning, whether in the form of an application for planned unit development, major or minor subdivision, major or minor development permit approval or any other form requiring the review and approval of the City, shall, as an element of its application for approval and review, evidence, to the satisfaction of the applicable City department, commission and/or City Council, compliance with the criteria and conditions of the Plan, as said Plan relates to such development application and the underlying Municipal Code requirements. All zoning and development hereunder is deemed to require the application of the more stringent of either (i) the Municipal Code or (ii) the Plan. An applicant may seek relief from specific elements of the Plan and/or the Municipal Code only through appropriate variance processes outlined in the City of Glenwood Springs Municipal Code.

Owner shall, within ninety (90) days after the mutual execution of this Agreement, submit a surveyed zoning map to the City. Such surveyed zoning map shall include legal descriptions for each of the twelve (12) zoning parcels (Parcels A through L, inclusive) identified by Exhibits B and C attached hereto. The City's Community Development Director and the City Attorney shall review such descriptions and, if generally consistent with the representations and approvals of the annexation and zoning public processes, shall approve the same. The City shall incorporate the surveyed zoning map into the Citywide zone district designation mapping and maintain an accurate and current copy thereof in accordance with State and local laws.

Prior to or contemporaneous with the first subdivision and/or development application for the Property, the Owner shall submit an overall geologic hazards map and mitigation plan of the Property to the City Engineer for his review and approval, which approval shall not be unreasonably withheld. The City shall incorporate the approved overall geologic hazards map and mitigation plan into the Citywide mapping and maintain an accurate and current copy thereof in accordance with applicable laws.

Prior to the first subdivision and/or development application for the Property, the Owner shall submit a Master Grading Plan and Master Drainage Plan for the development areas of the Property to the City Engineer. Said plans shall be consistent with the requirements of the Colorado Geologic Survey's letter dated October 23, 2001 and maintained on file with the City. Upon approval of said plans, Owner may apply for a grading permit to commence the preparation of all or part of the Property scheduled for development under the Plan. Based upon the detailed requirements and master planning of the Property as set forth herein and upon the Zoning and Development Plan attached hereto, such grading permit request may be granted by the City in advance of site specific development plans for an individual Parcel of the Property and may include certain off-site earth work, including, without limitation, (i) the "rough grading" of certain areas, as directed by the City, of Parcel L for said area's future use as active park facilities, and (ii) the



construction of debris mitigation structures within Parcel L as more fully described in Section 14 hereinbelow. All Master Grading Plans, Master Drainage Plans and grading permit requests shall include revegetation plans acceptable to the City Engineer and City Planning Department. At a minimum said revegetation plans shall incorporate grass, forb and shrub species into any debris flow mitigation structure development in a manner beneficial to wildlife for forage and cover and shall adequately address erosion control.

Prior to the first subdivision and/or development application for the Property, the Owner shall submit a Master Utility Plan for the development areas of the Property to the City Engineer. The City shall incorporate the Master Utility Plan into the Citywide mapping and maintain an accurate and current copy thereof in accordance with State and local laws and with City policy.

3. Non-Specific Assessments/Credits/Fees-in-Lieu of School Land Dedication

- a. Non-Specific Assessments/Credit. Any future impact fees, surcharges, special permit fees, special taxes or assessments, development fees or tap fees, and other items not addressed by this Agreement shall be exacted uniformly and non-discriminatorily on the Property and as exacted throughout the City. Notwithstanding the foregoing, nothing herein affects or shall affect the City's ability to exact impact fees for different facilities from certain residents or as to certain geographical areas. Owner shall receive full credit against any such future imposition for the full costs of all improvements, dedications, or payments made with respect to the matters to which such imposition relates. For example, in the event of a City's imposition of a fee for pedestrian trail facilities, Owner would be entitled to credit for the costs of all such trail improvements (as properly evidenced by invoices for design and construction) and dedications of land for trails (the value of which shall be established by the same appraisal mechanism described in Section 13.c. below) Owner had made up to that point in time on or concerning the Property.

Owner's credit for such costs shall include all costs incurred with respect to the applicable on-site or off-site improvements or dedications, including without limitation, all land costs (based upon the value of such land as vacant land, agricultural land or land for commercial or residential development, whichever is applicable, at the time the final plat for such land is approved), construction and construction management costs (excluding Owner's profit), and design, legal, consulting, and financing costs for the land so dedicated or on which the applicable improvements are constructed.

Notwithstanding the foregoing, Owner shall not receive credit as against such costs for the value of water rights dedicated or otherwise transferred to the City or the ownership shares of the attendant Atkinson ditch structure, both as more fully described by Section 11 hereinbelow. Further, in the case of an imposition of general applicability to provide general fund revenues, Owner shall not be entitled to credit against any impact fees or general assessments.

Except with respect to Parcel I as identified on Exhibits B and C hereof, Glenwood Meadows, its successors and assigns, shall not be required to pay any future Traffic/Transportation Impact Fee established by the City subsequent to the execution and recordation of this Agreement. The City and Glenwood Meadows have established the full and complete obligations of Glenwood Meadows with respect to on-site and off-site traffic/transportation improvements and financial contributions as set forth by Section 12 hereinbelow.

Owner does own, and the City acknowledges and ratifies such ownership herein, certain water and sewer system "Fee Credits" (specifically, 135 sewer system improvement fee credits and 135 water system improvement fee credits) arising from Owner's prior transfer to the City of certain lands for development of the Municipal Operations Center (see instruments dated December 27, 1999 "Municipal Operations Facility Site Acquisition Agreement" and January 17, 2000 "Assignment and Bill of Sale"). Owner and City shall maintain accurate records regarding Owner's use of such Fee Credits as the Property is developed.

- b. Fee-in-Lieu of School Land Dedication. Owner shall pay and the City shall accept fees in lieu of land dedication for the benefit of schools in the RE-1 School District (the "District") pursuant to Ordinance No. 34 Series of 1999 and Municipal Code Section 070.030.150. D.; or any amended version thereof in force and effect at the time of the final development permit approval of a given portion of the Property by the City. Such fees shall be applicable to the number of units proposed for all residential phases scheduled for development and shall be payable upon the issuance of a building permit for a residential dwelling unit. Owner shall have the right to seek relief from the obligation to pay such school impact fees for any "affordable housing dwelling units" or "employee housing dwelling units" provided by Owner or its assignees within the Property.

c. Credit to Owner for Actual Development of Public Facilities. Owner is specifically entitled to a credit against any City parkland improvement fee or similar fees if eventually implemented and which would be otherwise applicable to development on the Property as follows:

- (i) the value of land dedicated to public use and the costs of construction of pedestrian and bicycle trails within the Property as more fully described by Section 13(a) and 13 (b) below;
- (ii) the value of land dedicated to public use and the costs of construction or Owner's contributions to the costs of construction of pedestrian and bicycle trails outside the boundaries of the Property as more fully described by Section 13(c) below;
- (iii) the value of any "rough grading" performed by Owner, its successors and assigns, as requested by the City pursuant to the provisions of Section 15 below; and
- (iv) the value of land, if any, dedicated by the Owner to the City for public use and enjoyment as open space, active parklands and passive parklands in

Parcel L, which lands represent a dedication in excess of the quantity of such lands otherwise required to be dedicated in support of the development on the Property.

Owner shall not be entitled to any credit against such fees for the development of commonly owned open spaces and recreation facilities within the development of Parcels A through K.

4. Conditions Precedent.

a. The provisions of this Annexation Agreement shall not be effective until the following conditions have been satisfied in full:

(1) Final approval has occurred as follows:

(a) For the purposes of this Agreement, final approval occurs on the thirtieth (30th) day following the effective date of the latest of the motion, ordinance and/or resolution by which the City Council (hereinafter "Council") approves:

(i) This Agreement;

(ii) The formal annexation of the Property to the City;

(iii) The zoning for the Property as C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial, R-3 Residential and HP Hillside Preservation; and

(2) Owner and City have mutually executed and delivered this Agreement for recordation with the Garfield County Clerk and Recorder.

b. If any legal proceedings, referenda, or elections are commenced regarding any of the items specified in Section 4(a) hereinabove, and in accordance with the City's Municipal Charter, but are not favorably concluded within fifteen (15) months thereafter (subject to each party's obligations pursuant to Section 5 below), this Agreement may be terminated by either party upon written notice to the other.

c. If none of the actions addressed in Section 4(b) above is taken or commenced within such thirty (30) days, or if an election is called pursuant to said Section 4(b) and ratification thereafter made by the voters of the City, then Final Approval shall occur upon conclusion of the election.

5. Cooperation in Defending Legal Challenges. If any legal or equitable action or other proceeding is commenced by a third party: (a) within one (1) year after the Final Approval, challenging the validity of the annexation of the Property into the City or the City's zoning of the Property or the City's execution and delivery of this Agreement, Owner and the City shall defend

such action or proceeding; or (b) subsequent to such one-year period, challenging the validity of any provision of this Agreement (other than as set forth in clause (a) above), Owner and the City agree to cooperate in defending such action or proceeding, and in connection with any such action or proceeding, the City shall bear its own expenses and Owner shall bear Owner's expenses. Unless the City and Owner otherwise agree, each party shall select its own legal counsel to represent it in connection with any such action or proceeding.

6. Interim Use of Available Raw Water During Site Development. The parties agree that the developer of the Property may utilize the Atkinson Canal and associated water rights being dedicated to the City for dust mitigation and site preparation during the grading and construction activities on the Property. If the developer elects to so utilize the water structures and water rights, all cost, including but not limited to construction, maintenance and legal fees associated with such use shall be borne exclusively by said developer.

7. Deannexation. The provisions of this Agreement, as well as acceptable City zoning of the Property, are material considerations of Owner's agreement to annex the Property to the City. Therefore, in the event (a) the City fails to perform under the terms of this Agreement, or (b) Owner is unable to obtain, either before or after annexation proceedings are complete, C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial and R-3 Residential zoning and/or subdivision and/or development approval (subject to limitations herein set forth) which it in its sole discretion finds acceptable, Owner and the City stipulate and agree, pursuant to C.R.S. §31-12-501, that it shall be in the best interest of the City that the Property be de-annexed from the City. In such event, the City agrees that it shall initiate de-annexation proceedings, and to take all steps necessary to effect the de-annexation. The City further acknowledges and agrees that de-annexation is not prohibited by the City Charter or Municipal Code and ordinances, and that the City will not amend its ordinances to preclude a de-annexation permitted hereunder. The parties' right to de-annex shall be in addition to those rights set forth in Section 4, above. Upon the de-annexation of the Property from the municipal boundaries and specific jurisdiction of the City, the City agrees that it shall convey, assign, transfer and quitclaim to Owner, its successors and assigns, any and all land and water rights (the public dedication of which is more fully described by Section 11 hereof) previously dedicated by Owner hereunder to the City for the public use and benefit.

8. Owner Representations. All representations of Owner set forth in its annexation petition, annexation plat, public hearings on the application for C-1 Limited Commercial, C-2 Core Commercial, C-4 Resort Commercial and R-3 Residential zone district classification, the Zoning and Development Plan and mapping and related documents shall, if accepted by the City, be considered incorporated into this Agreement as if set forth in full herein. Notwithstanding their incorporation by reference, the City makes no representations about the accuracy of such documents.

9. Site Planning/Density Limits/Plats/Subdivision Improvements Agreements. The City and Owner agree to the following terms and conditions regarding site planning, vested rights, subdivision improvements agreements (hereinafter "SIAs") or development permit agreements (hereinafter, "Development Permits") and plat recordation:

- a. Site Planning. Unless otherwise mutually agreed upon by the parties, Owner shall develop the property in eleven (11) distinct phases; each of which shall correspond, according to the surveyed zoning map described by Section 2 hereinabove, to one of the zoning parcels (A through K) generally set forth by Exhibit B and Exhibit C (hereinafter, a "Parcel" or the "Parcels"). One or more zone parcels may be commenced as a single phase of site specific planning and development, provided the developer thereof complies with all obligations of each parcel's development; to wit, the timing and amount of applicable Off-Site Transportation Improvements (Section 12 hereof), the Geotechnical Mitigation requirements (including debris flow detention facility extensions) (Section 14 hereof) and all other applicable fees and conditions of development associated with each zoning parcel. During any planned unit development ("PUD") review process, subdivision process, development permit process or other development process, Owner shall submit to the City a final plat for each encompassed Parcel, which plat shall correspond to and indicate the proposed plan of development in each Parcel of the Property (the "final plat"), which shall include, at a minimum, the intended locations and densities of such development. The parties agree that the final plat shall be recorded promptly following approval.

The City and Owner agree that, together with the application for the first subdivision and/or development on the Property, except the subdivision and or development of Parcel I, and otherwise regardless of which zoning parcel or phase is involved, an element of the approval of the final plat thereof shall be the public dedication to the City, either by such plat or by separate conveyance instrument, of the HP Hillside Preservation (Parcel L) lands. It is further agreed that such conveyance shall and does provide part of the consideration herein agreed to and accepted by the parties as support for Owner's enforceable vested rights as further described and defined in Section 10 hereinbelow. It is also agreed that the dedication and conveyance of other, future public lands and facilities (such as publicly dedicated streets and utility easements) will occur in conjunction with future subdivision and/or development application approvals.

- b. Infrastructure Easements. Regardless of Owner's schedule, Owner agrees to provide infrastructure for roads, water and sewer facilities, electrical and natural gas service, and other facilities and services as mutually agreed upon by Owner and the City Engineer to serve the Property adequately during the period(s) between development of parcels. Such infrastructure shall be provided at Owner's expense, and shall be reviewed and subject to approval by the City. Owner will loop water or sewer lines or provide other stand-alone features of such infrastructure, all as approved by the City engineer, to accomplish this goal. The City shall accept easements for such public facilities pending the actual and final public dedication of the same upon the final platting of the affected Parcel(s).
- c. Density Cap. Notwithstanding the zoning designation of the Property as: (i) a C-1 Limited Commercial zoning district (Parcels A, C, D and H on the Plan) or C-2 Core Commercial zoning district (Parcels E, F and G on the Plan), Owner agrees that it shall not plan, develop, construct or sell more than 490,000 total square feet of



commercial space (exclusive of any development which may occur within that area of the C-4 Resort Commercial zone district identified as "Hospitality" [Parcel I on the Plan], the density maximums of which are separately limited by the City's Municipal Code) within the Property; and (ii) an R-3 Residential zoning district (Parcels B, J and K of the Plan), Owner agrees not to plan, develop, construct or sell more than 475 residential dwelling units (subject to the provisions of Section 9(c)(i) below) within Parcels B, J and K.

(i) *Specific Housing Agreements between Owner and City.* The Owner and its successors-in-interest shall comply with the City's community housing requirements contained in Ordinance #24, Series of 2001, Inclusionary Residential Requirements for Affordable Housing and the applicable Guidelines, as contained in Resolution #2001-16. Glenwood Meadows further agrees that a minimum of twenty (20) dwelling units shall be developed on the Property and shall be located within the mixed-use Parcels E, F and G. Finally, the City and Owner agree that no more than three hundred (300) of the total residential dwelling units permitted hereunder shall be commercial apartment rentals as "apartments" are now or may hereafter be defined in the City's Municipal Code.

(ii) *Limitation.* The foregoing density limits shall not apply to portions of the Property conveyed to or developed as (i) governmental services facilities (including a public school district facility) or (ii) non-governmental, non-profit health and human services facilities. Except as expressly provided herein to the contrary, proposed land uses which exceed the maximum density limits established hereby and reiterated by the incorporated Zoning and Development Plan shall require the written mutual execution of a specific amendment to this Agreement. No such amendment shall be valid unless approved at a duly and properly noticed, public hearing before both the City's Planning & Zoning Commission and the Glenwood Springs City Council on the question.

d. SIA/Development Permits and Plat Recordation. The City and Owner shall, following Council approval of the final plat of one or more of the Parcels of the Property's development, but before the final plat is recorded, negotiate acceptable terms of a separate subdivision improvements agreement ("SIA") for the Parcel(s) scheduled to proceed to development. The City shall authorize the Mayor to execute the SIA for the Parcel(s) following final plat approval. The City shall further authorize the Mayor to execute the SIAs for subsequent Parcel(s), subject to the foregoing:

- i. No SIA for any Parcel shall be recorded until all necessary documents in support of that Parcel, including a financial guarantee acceptable to the City, updated cost estimates for public improvements, and an updated title commitment, all pursuant to the Municipal Code (the "Financial Items") have been provided to the City and approved by City staff. For purposes of this Agreement, both (i) Off-Site Transportation Improvements in

accordance with the provisions of Section 12 hereinbelow and the Glenwood Meadows' Transportation Improvements Plan and (ii) Geotechnical mitigation requirements applicable to a given phase of development (including debris flow detention structure extensions) in accordance with the provisions of Section 14.a. hereinbelow, shall be deemed included within the definition of "Financial Items" requiring review and approval of the City's Community Development Director prior to recordation of the final plat of a given approved phase of development. Upon the City's receipt of the Financial Items, no public hearing shall be necessary if all City review departments approve the Financial Items without imposing conditions thereon and without recommending or requesting a public hearing. Nevertheless, the SIA for each phase of the Property's development shall be subject to Council review and approval at a regular Council meeting. Promptly following final approval and execution, the City shall record the SIA for the Parcel(s), which will thereafter proceed to be developed.

- ii. The parties agree that any filing or other numbers which appear on the final plat for the various phases of development of the Property are for reference and identification purposes only and have no bearing on the sequence in which the Property may be developed.
- iii. Owner may only sell lots on the Property located within a Parcel:
  - A. which includes within its final plat and design an identification of the lot(s) to be sold;
  - B. for which an SIA designating said lots has been executed and recorded; and
  - C. for which acceptable financial guarantees have been posted to secure construction of improvements.

In the absence of a specific "subdivision" request, the Financial Items and other obligations required hereunder may be enforced by the City through conditions of Major Development Permitting or other similar and enforceable mechanics.

- e. Compliance With Agreement and Subsequent Obligations. Owner's compliance with all requirements of this Agreement, the Plan, the Municipal Code and other governing documents incorporated herein or as part of the zoning approval process, including future SIA/Development Permit instruments, is a condition of subdivision and/or major development permit approval. Notwithstanding the foregoing or Section 10 hereinbelow, nothing herein shall constitute a guarantee, covenant or agreement that the City shall approve such application(s) in the event of non-compliance.

10. Vested Rights. In order to allow Owner a reasonable opportunity to develop the Property in accordance with this Agreement, the Zoning and Development Plan, the Final Approval and in consideration of the substantial public dedications of land as described herein and upon the attachments hereto, the development rights and uses approved thereby shall, to the extent allowed by law, constitute a "site specific development plan" under C.R.S. §§24-68-101 et seq., as amended. Subject to Owner's satisfactory completion of Parcel phases of development pursuant to this Agreement, the site specific development plan shall be vested in Owner under the following conditions:

- a. The site specific development plan shall be vested for a period of ten (10) years, beginning on the date the final plat of the first phase of development on the Property is recorded (the "Vested Period"). The Property as to which rights have been vested shall be immune from changes in the City's land use regulations for the duration of the Vested Period, subject to the below provisions.
- b. After the Vested Period expires, this Agreement shall be deemed terminated and of no further force or effect as to such phase; provided, however, that such termination shall not affect (a) annexation to and zone district designations of the Property in the City; (b) any common-law vested rights obtained prior to such termination; (c) any right arising from City permits, approvals or other entitlements for the Property which were granted or approved prior to, concurrently with, or subsequently to the approval of this Agreement; (d) any continuing obligations of Owner regarding providing services or facilities to such phase, performing covenants implied within this Agreement, or other Owner responsibilities under this Agreement, which shall survive termination; or (e) any rights of the City relating in any way to Owner's performance or nonperformance hereunder.
- c. Notwithstanding the foregoing, if Owner does not complete the items listed and intended for each phase within the time period allotted for construction of such phase pursuant to an applicable SIA, the Vested Period as to all uncompleted work on the Property in connection with the subject phase(s) shall expire, vested rights as to such uncompleted work shall be extinguished, and this Agreement shall terminate in favor of the provisions of the applicable SIA. "Completion" for the purpose of this paragraph shall mean that all work for such phase shall have been performed, submitted to the City for approval, and finally approved pursuant to applicable City subdivision and platting requirements, and that Owner properly posted financial guarantees acceptable to the City to assure completion of that phase's improvements within the time period allotted by the subject SIA.
- d. Except in instances of force majeure, the requirements of federal or state law, cases of preemption or other superior jurisdictional mandate, the City shall not initiate any zoning or land use action which would alter, impair, prevent, diminish, impose a moratorium on development, or otherwise unreasonably delay any of Owner's rights set forth in this Agreement or Owner's plans for development or zoning, as approved by the City.

- e. Notwithstanding the foregoing, the establishment of vested property rights under this Agreement shall not prevent the City from enacting and enforcing regulations of general applicability (including, but not limited to, building, fire, plumbing, electrical and mechanical codes, including the preliminary plat and final plat subdivision requirements under the Municipal Code and other City ordinances), except where the approved plans for development of the Property or state or federal regulations provide otherwise, as all of such regulations exist on the date of this Agreement or may be enacted or amended after the date of this Agreement.

11. Water Rights Dedication and Ditch Structure Conveyance. At or before the time the recordation of the final plat for the first phase of subdivision and/or development (whereupon the land zoned as HP Hillside Preservation shall be dedicated to the City for public use and enjoyment as open space, active park lands and passive park lands), but in no event later than six (6) months after the mutual execution of this Agreement, Owner shall convey by special warranty deed to the City, free and clear of all liens and encumbrances (but subject to the provisions of Section 6 hereinabove), water rights acceptable to the City, as determined by mutual agreement to be satisfactory to provide a secure, legal water supply for appropriate useful application within the proposed development contemplated by this Agreement and the Plan; provided, however, Owner's obligations in this regard shall be limited to the historic water rights owned by Owner and used on the Property. Prior to dedication, the Owner and City shall agree to the maximum needs of the contemplated uses. The water rights dedicated shall be those historically associated with the subject Property and more specifically known as priorities 105A, 107A, 228 and 594 as decreed in Case Nos. 1056, 1225, 1338 and 4033 respectively. The Owner may retain water rights which exceed the needs described above, provided that the water rights retained are junior in priority to those dedicated and that any change in the point of diversions downstream of the point of diversion utilized to service the annexed Property. In addition, the Owner hereby agrees not to oppose any application by the City for an alternate point of diversion for the dedicated water rights in order to better serve the Property and the City's needs. Owner shall be entitled to sever and maintain ownership of those water rights not necessary for the City to offset the future use on the Property. Owner shall be solely responsible for the costs associated with any legal proceedings, including those related to approval of an augmentation plan or request for change in use, arising from the retention by Owner of any portion of its present water rights. By this conveyance, Owner shall fully satisfy any and all water rights dedication requirements of the City for annexation and development of the Property as set forth in the Municipal Charter and Municipal Code and as approved by the City Council.

As an element of the consideration hereunder, Owner agrees to assign one hundred percent (100%) of its ownership interest in and to the Atkinson Canal Company to the City contemporaneous with the dedication of water rights described by this Section 11. Such assignment shall include, without limitation, all right, title and interest of the Atkinson Canal Company in any agreements, contracts, easements, rights-of-way and other appurtenant benefits.

Owner, as an element of its Master Drainage Plan and its Master Utility Plan, shall at Owner's sole cost, design a raw water irrigation system, acceptable to the City Engineer, serving the Property and adjacent City-owned lands (i.e. Community Center, MOC Site and the Parcel L property). The City shall be the owner of any such raw water irrigation system and shall pay for the

costs associated with construction of the same. Upon the City's development of a raw water irrigation system, all development within the Property shall be required to purchase such taps and pay such other fees as are generally applied to the system's use.

12. Off-Site Traffic Improvements Obligations. As an element of the City's approval of (i) Owner's Petition for Annexation, (ii) Owner's Application for Zoning and (iii) acceptance of this Agreement, the Owner has agreed to make certain improvements to the surrounding transportation system and to cooperate financially with the City on specified future transportation system improvements as described herein:

- (a) As a specific requirement of any application for a Parcel's subdivision and/or development, the Owner shall calculate the estimated number of daily trips attributable to the site specific development's intended uses and provide the City with a complete copy of said calculations for the City's records.
- (b) Owner shall cooperate with the City to obtain a CDOT Access Permit on behalf of, and in the name of the City. The City shall be provided a copy of any Access Permit granted hereunder. Said Access Permit shall describe the nature and impacts of construction and improvements affecting the Interstate 70/Midland Avenue right-of-way areas. Owner shall pay the costs of the Access Permitting process and shall comply with the terms associated therewith.
- (c) Owner shall be responsible for the design and, upon approval of the City Engineer, the construction of improvements at the intersection of Midland Avenue and Eighth Street. Said improvements shall accommodate existing and anticipated traffic as described by the Owner's Transportation Improvements Plan through intersection modification, grade modification and/or signalization. Owner and or its assigns shall be responsible for all costs of administration, design and actual construction of the approved improvements; the City shall be responsible for all necessary costs of right-of-way acquisition for the approved improvements. The improvements contemplated hereby shall be completed prior to or contemporaneous with the issuance of a final and permanent certificate of occupancy by the City's Building Department for any structure within the first Parcel of commercial and/or residential development (exclusive of any proposed subdivision and development on Parcel I). Provided, however, Owner may apply for and obtain subdivision and/or development permit approval for development on the Property in advance of the actual construction of the improvements herein described; provided however that (i) the obligation to complete the improvement is included in the Financial Items of the respective SIA(s) (see Section 9(d) above) and thereby, the performance secured, and (ii) no permanent certificate of occupancy for any structure on Parcels A, B, C, D, E, F, G, H, J or K shall be issued until the completion of said improvements; provided, however, in the event circumstances warrant, the Owner may apply for relief from the constraints of this Section 12(c) by application to the City Council. Any such relief shall be within the sole and exclusive discretion of the



City Council and may be subjected to such other conditions, as determined by the City Council at that time.

- (d) Owner shall be responsible for the design and, upon approval of the Colorado Department of Transportation ("CDOT") and the City Engineer, the construction of two (2) roundabouts or other acceptable and approved improvements at the Interstate 70 and Midland Alternate Route highway interchange at Exit 114. Said improvements shall accommodate a potential full interchange at the North and at the South sides of said Exit 114. Owner and or its assigns shall be responsible for all costs of administration, design and actual construction of the approved improvements; the City shall be responsible for all necessary costs of right-of-way acquisition for the approved improvements. The improvements contemplated hereby shall be completed prior to or contemporaneous with the issuance of a final and permanent certificate of occupancy by the City's Building Department for any structure within the first Parcel of commercial and/or residential development (exclusive of any proposed subdivision and development on Parcel I). Provided, however, Owner may apply for and obtain subdivision and/or development permit approval for development on the Property in advance of the actual construction of the improvements herein described; provided however that (i) the obligation to complete the improvement is included in the Financial Items of the respective SIA(s) (see Section 9(d) above) and thereby, the performance secured, and (ii) no permanent certificate of occupancy for any structure on Parcels A, B, C, D, E, F, G, H, J or K shall be issued until the completion of said improvements; provided, however, in the event circumstances warrant, the Owner may apply for relief from the constraints of this Section 12(d) by application to the City Council. Any such relief shall be within the sole and exclusive discretion of the City Council and may be subjected to such other conditions, as determined by the City Council at that time.

The Owner and the City have agreed to jointly pursue the recovery of any funds which may be available from CDOT or other sources to reimburse the parties for the capital costs associated with the improvements contemplated by this Section 12(d). In the event the Owner and City are able to recapture any such funds within ten (10) years of the anniversary of this Agreement, Owner or its successors and assigns shall be entitled to recover therefrom only the amount of the actual costs of design, engineering and construction for the subject off-site transportation improvement project. All other recaptured funds, regardless of their source, shall be paid to the City and applied to other City transportation improvements.

- (e) Owner shall, at the earlier of either (i) the completion of seventy-five percent (75%) of the total commercial square footage approved hereunder, or (ii) upon the request of the City Engineer following the commencement of actual construction and development on the Property (such request being evidenced by

documentation of escalating traffic counts along the Midland Avenue corridor which the City Engineer has then determined warrants the improvement of the width of the Midland Avenue Alternate Route), pay all costs of administration, design and construction for the four-laning of the section of the Midland Avenue Alternate route from the present Community Center access point at Wulfsohn Road westerly to the present MOC access point at Wulfsohn Road, inclusive. Owner's responsibility for the four-laning of said section of the Midland Avenue Alternate Route is contingent upon the City's assumption of the obligation to simultaneously pay all of the costs for the administration and design of four lanes on two (2) other sections of the Midland Avenue corridor, to wit: (i) the section from the Colorado River to Wulfsohn Road at the present MOC access point and (ii) the section from Wulfsohn Road at the present Community Center access point to the Eighth Street and Midland intersection. Owner shall contribute to City twenty-five percent (25%) of the actual construction costs for these improvements. The City shall not attribute any financial responsibility for right-of-way acquisition for the improvements hereunder to the Owner. In the event the City Engineer has not required the four-laning of these sections of the Midland Avenue corridor prior to the Owner's commencement of any part of the final twenty-five (25%) of the total approved commercial square footage on the Property, the Owner may estimate, subject to the reasonable approval of the City Engineer, the costs of all improvements contemplated hereby and pay to the City as full and final discharge of Owner's obligations under this Section 12(e) its proportionate share of the estimated costs (i.e. 100% of the costs of the four-lane construction of Midland Avenue Alternate Route adjacent and contiguous to the Property and 25% of the costs of the four-lane construction of Midland Avenue Alternate Route at the two (2) non-adjacent, non-contiguous sections as described herein).

- (f) Owner shall be responsible for one hundred percent (100%) of the costs associated with the design and construction of one new access point from the Property to Midland Avenue. The design of any such access point and roadway intersection shall require the prior approval of the City Engineer. Owner shall be responsible for one hundred percent (100%) of the costs associated with the design and construction of a new limited purpose (i.e. an unsignalized right-turn-in/right-turn-out only) access point from the Property to Midland Avenue. The design of any such secondary access point and roadway intersection shall require the prior approval of the City Engineer. Any new access points contemplated by this Section 12 (f) shall, as an element of their design and construction, incorporate a pedestrian grade separation, the design for which shall be subject to the review and approval of the City Engineer. The City may, upon the request of Owner, waive this pedestrian grade-separation obligation if the City has determined that a westward extension of the City-wide or regional trail system is not anticipated.

The City and Owner hereby agree that in the event a city-wide off-site transportation improvement fee program of general applicability within the City's municipal limits shall be hereafter duly

adopted by the City, said program of general applicability shall apply only to the development of Parcel I on the Plan.

Owner's contribution to the construction and land dedication for on-site pedestrian and bicycle trail connections, including the costs incurred in developing grade-separated crossings, shall be credited to Owner, its successors and assigns, against any other applicable fee(s) now in the Municipal Code or hereafter adopted by the City for the express purpose of improving trails and similar parkland facilities. The Owner shall be responsible for providing to the City copies of all applicable cost records for such expenditures.

13. On-Site Pedestrian/Off-Site Pedestrian Commitments, Transportation Demand Management Commitment; and Transit Commitments. The following commitments regarding pedestrian and bicycle trails development are intended to be exclusive of obligations by the Owner or a future developer with respect to sidewalks and other connections which are distinctly required by the Zoning Plan, the City Code or other applicable requirements.

- a. On-Site Hard Trail. The City and Owner have agreed that the City Rivertrail system shall be continued across the Property. Owner has agreed to design and build such a Rivertrail extension as set forth hereby in phases which correspond to the sections of such trail affected by the site specific development of the Parcels of the Property. Upon completion of any phase or section of the Rivertrail, the Owner or its successor-in interest shall dedicate a permanent easement for the Rivertrail's public use, benefit and maintenance using specific, as-built legal descriptions for such transfer of interest. Therefore, within any Parcel of the Property burdened by the existing thirty foot (30') wide underground Public Utility Easement granted by Owner to the City by that certain instrument dated August 8, 2000 (being, specifically, Parcels A, C, D, E, H and I), which Parcel is the subject of application for site specific development, the design and construction of the Rivertrail extension shall be included within such application and planning in a manner substantially in compliance with the City adopted Rivertrail Standards and at a minimum shall be designed in a quality similar to comparable existing Rivertrail improvements in the City. The estimated costs therefor shall be included in the Financial Items accompanying any approval of the Parcel's development. In the event the City desires to proceed with the design and construction of the Rivertrail extension on Parcels of the Property in advance of Owner's application for development on such Parcel(s), then at the time Owner or its successors do develop such Parcel(s), it shall be required, as a Financial Item of approval, to reimburse the City for its actual design and construction costs associated with said Rivertrail extension as determined on a per linear foot basis.
- b. On-Site Soft Trail. The City and Owner have agreed that, in conjunction with Owner's development of any section of the debris flow mitigation structures as described in Section 14 hereinbelow, and whether the actual approved location of said debris flow mitigation structure is within the Parcel L lands or within portions of the Parcels B, J or K lands, that Owner or its successors-in-interest shall design

and construct a "Soft Trail" (i.e. no asphalt or concrete) within, on or near the subject debris flow mitigation structure. The design characteristics of the Soft Trail shall, at a minimum, conform to the design characteristics of other City-owned soft trail systems within the City. In the event the City, at the time of the application for development requiring the construction of a section of the debris flow mitigation structures, determines that such a Soft Trail is, at that time, inconsistent with the City's goals, policies and plans for the public use and benefit of the Parcel L lands, then it may direct the Owner to eliminate the Soft Trail development from said application for development.

- c. Off-Site Rivertrail Contribution. The City and Owner have agreed that Owner shall be responsible for contributing fifty percent (50%) of the actual costs of constructing the section of the City Rivertrail system, or other City-adopted pedestrian connection, from the existing Community Center access point at Wulfsohn Road (commencing at Owner's eastern boundary of Parcel I) to the intersection of Eighth Street and Midland Avenue. In no event shall Owner's obligation hereunder exceed the lesser amount of either (i) fifty percent (50%) of the actual construction costs of such off-site trail project as are presently set forth by that certain Pedestrian Feasibility Study dated March 6, 2002 and conducted by OTAK on behalf of the City (the "Study"), which Study estimates a total cost for the City-adopted Alternate B solution at \$1,055,000.00 or (ii) fifty percent (50%) of the actual construction costs of such off-site trail project as determined upon completion of said project, regardless of the estimates set forth in the Study (each of the two foregoing limitations upon Owner's financial obligations are further subject to any credits for land dedication as set forth hereafter). Owner owns a 100% undivided interest in certain, presently unincorporated land situate on the northeastern boundary of the Midland Avenue Right-of-Way (commonly known and referred to as the "Wulfsohn East" parcel). Owner has agreed to grant the City an above ground permanent easement for the use of a part of the Wulfsohn East parcel for purposes of providing a safe and beneficial connection from the area of the Community Center to existing City pedestrian corridors. The value of the land dedicated to the City on the Wulfsohn East parcel, by easement or otherwise as hereafter agreed by the parties, shall be deducted from Owner's financial contribution obligations pursuant to this Section 13(c). The "value" shall include any diminution of the value of Owner's other land within the Wulfsohn East parcel, if any. In the event the parties are unable to agree as to the value of Owner's land contribution hereunder, each party shall engage a qualified, licensed appraiser to research and analyze such value. The value shall then be permanently established by the average of the two (2) appraisals. The City agrees that it shall be solely and exclusively responsible for the design and construction of the pedestrian improvements contemplated hereby and shall use all reasonable means to construct the same prior to the commencement of development on the Property; provided, however, that the City further agrees that it shall not unreasonably withhold any subsequent Permits or other development approvals based upon the City's inability to timely complete such trail/pedestrian path construction.

- d. West Property Park and Ride Land Reservation. Owner has agreed to reserve from development, for a period not to exceed five (5) years after the mutual execution of this Agreement, a section of land, not to exceed two and one-half (2.5) acres in size at the west end of Parcel A on the Property (hereafter, the West Park and Ride Site"), for the possible acquisition by the City or other appropriate governmental entity through purchase, exchange or other mutually agreeable mechanism of transfer, for the express use of such West Park and Ride Site as a public park-and-ride/transit facility. In the event the City, or other appropriate governmental authority as assignee of the City's rights hereunder, does not notify Owner or its successors and assigns in writing, on or before the established deadline described immediately above, of its intention to exercise the acquisition of the West Park and Ride Site, Owner shall be relieved from any obligation hereunder to further reserve the Site. In determining the price of the West Park and Ride Site, the parties shall either (i) agree to a price, or (ii) each party shall retain the services of a qualified, licensed Colorado real estate appraiser to appraise the value of the land as such land was zoned immediately prior to the annexation of the Property (Garfield County zone district A/R/R/D), with such value escalated for the passage of time during the reservation period at a rate equal to the published Denver/Boulder Consumer Price Index established as of the date of final annexation and adjusted annually on each anniversary thereof; the average of the appraised value by each appraiser shall be deemed the purchase price for the governmental acquisition of the West Park and Ride Site.
- e. East Property Transit Center. This Agreement shall obligate the Owner and/or eventual developer of the land within Parcel I of the Property to negotiate in good faith, at the time of site specific development application, for the dedication to the City of an adequate land area, not to exceed one (1) acre, and location therefor for the City or its agent's development of a transit center facility and attendant parking area. In the event the City and Owner are unable to reach agreement as to the location, size and dedication of such a transit facility and parking area within the proposed development of Parcel I, then, upon the approval of a site specific development proposal for Parcel I, the Owner or its successors and assigns shall make a mandatory contribution to the City in an amount equal to the value of one (1) acre of land within said Parcel I as determined by mutual agreement or as determined by the average of two appraisals; one such appraisal shall be commissioned by the City and one such appraisal shall be commissioned by the Owner, its successors and assigns. In the event the parties do agree on a mutually acceptable size and location for the transit center and parking area, the City shall accept transfer of the site following the issuance of appropriate development approvals and the City shall accept sole and exclusive responsibility for the costs of designing and constructing the facility. The City agrees that any such development of a public transit center and parking area shall comply with all applicable underlying design criteria established by this Agreements and the exhibits hereto in addition to any applicable Municipal Code requirements.



14. Public Improvements/Geotechnical Mitigation Improvements and Maintenance Obligations. All public improvements required by the Plan, including the development of internal public streets and public utility line extensions, shall be included and subject to performance and financial guarantee requirements referenced in the respective SIA(s)/Development Permit(s). Additionally, at the time a final plat is recorded, Owner shall commit to the dedication, conveyance and assignment to the City all public improvements within the subject phase, together with any land, by deed or easement instrument acceptable to the City, necessary to accommodate such public improvements, and shall, upon completion and acceptance by the City of said public improvements, so dedicate, convey and assign the same in perpetuity. Finally, Owner shall dedicate or convey such public improvements by bill of sale or special warranty deed, free and clear of any liens or encumbrances which would prevent the City from using said public improvements or associated land for their intended purposes.

- a. Specific Geotechnical Mitigation Improvements Obligations. All land use and development undertaken on the Property shall comply with the recommendations and requirements of both the Geotechnical Analysis Summary prepared by High Country Engineering, dated September 17, 2001, as amended, and the Drainage Summary prepared by High Country Engineering, dated September 17, 2001, as amended; both of which were reviewed by the office of the Colorado Geological Survey and were incorporated into the City's approval of the Plan. Copies of each report are maintained in the records of the City. More specifically, any application for development of any phase of development on the Property shall, at a minimum, comply with the following conditions and recite the same as a plat note on the recorded plat instrument:

"Foundation/Grading Requirements. Preliminary soils investigations encountered low density and compressible silty sand and gravel debris fan deposits. These soils are hydro-compressive and tend to settle under load when wetted. Subsurface wetting is likely to occur as the result of surface runoff, irrigation and leaky utilities, therefore measures to mitigate settlement shall be required as a part of the site development. Foundation and grading requirements are as follows:

- a. Foundations for the site may include driven or drilled pile, reinforced mat, spread footings placed on either pre-wetted soils or structural backfill.
- b. Site Grading shall be performed prior to building pad and foundation construction. Site grading and building pad construction should be performed as early as possible to allow for settlement.
- c. The ground surface should be sloped at a minimum of 5% for the first ten feet away from foundations in all directions in unpaved areas and 2.5% in paved areas.
- d. The Owner shall be responsible for submitting an engineer certified soils report that includes a section on paving requirements. The soils report should include moisture and compaction requirements, excavation and backfill requirements, evaluation of swell and consolidation potential, slope stability and foundation recommendations for structures. The pavement section of the report should include traffic loadings, sub-grade preparation and pavement recommendations. This report must be submitted

and approved prior to beginning either foundation construction or roadway/parking lot construction.

#### **Surface/Subsurface Drainage Requirements.**

Downspouts and drains should discharge outside the limits of the backfill. Landscape requiring irrigation should be placed a minimum of ten feet from foundation walls.

An under-drain system will be required for all below-grade construction.

#### **Utility Construction**

- a. Wet utilities will be required to utilize restrained joints throughout the project limits.

#### **Debris Flow Mitigation**

- a. It is anticipated that the project area will be developed in phases. Each individual phase will be required to construct debris flow mitigation measures in accordance with the Debris Flow Mitigation Plan prepared for the entire development and as approved by the City Engineer. In the event the City desires to proceed with the design and construction of a portion or all of the structures required by the Debris Flow Mitigation Plan, as may be amended from time to time with the approval of the City, upon the lands identified as Parcel L of the Property in advance of Owner's application for development, then at the time Owner or its successors do develop such any Parcel(s) which would have required, as an element of development the construction of such debris flow mitigation structures, such Owner or its successor shall be required, as a Financial Item of approval, to reimburse the City for its actual construction costs associated with said debris flow mitigation structure(s), together with interest on such costs, from the time expended by the City to the time of such reimbursement, at a rate equal to the local construction price index.
- b. Debris flow mitigation measures for the project include diversion ditches, berms and debris detention basins located along the southwest perimeter of the property.
- c. The Owner's Association or a special district will be responsible for maintenance of the debris flow mitigation measures. Maintenance should include removal of debris following an event and routine mowing.
- d. The Owner's Association or a special district will be responsible for irrigation of the slopes until permanent vegetation has been established.

#### **Rockfall**

- a. Rockfall hazards are limited to those areas identified in the Geologic and Preliminary Geotechnical Investigation Glenwood Meadows Glenwood Springs, Colorado prepared by CTL Thompson dated February 1, 2000. There is not a potential rockfall hazard associated with the development of this Property. The only rockfall hazard identified for the area is to the west of the land zoned for future development near the existing City Municipal Operations Center site."

Additionally, as an element of Owner's obligation to submit a Master Drainage Plan and a Master Debris Flow Mitigation Plan as set forth under Section 2 hereinabove, such plans submitted to the City shall specifically include (i) an analysis of acceptable outfall corridors from the low points in all identified detention basins, (ii) an analysis of the preferred routes for such flows from the basins to be conveyed through the Property to existing or improved drainage facilities along the north boundary of the Property, and (iii) an analysis of the capacity of the aforementioned existing or improved drainage facilities and related conveyance structures which are intended to deliver excess moisture to the Colorado River. All of the foregoing data shall be reviewed and approved by the City Engineer prior to the issuance of any building permit on the Property.

15. Open Space and Park Land Dedication. In full and complete compliance with relevant park land public dedication and open space public dedication requirements referenced in the Municipal Code, Owner will dedicate the area zoned as HP Hillside Preservation, shown on the Plan as Parcel L, to the City at final plat recordation for the first phase of land use on the Property. Neither the Owner nor its successors-in-interest shall be required by the City to develop any portion of the publicly dedicated lands for active recreation purposes, except as may be otherwise hereafter agreed as an element of the development of Parcel K of the Property's development (Owner or its assigns shall "rough grade" the area of Parcel L, adjacent to said Parcel K and the City's Community Center, for no more than two (2) baseball/softball fields, upon the direction of the City if such direction is provided to Owner prior to commencement of Owner's initial grading for the development of Parcel K of the Property). In partial consideration of the dedication of the Parcel L lands, the City has agreed to plan and develop a permanent water source retention structure for the benefit of indigenous wildlife; such structure shall be developed by the City, subject to the necessary appropriation of funding, following the dedication of the Parcel L land by Owner. The City agrees that its acceptance of the dedication of such lands shall be deemed a "governmental use" (as defined by the Glenwood Springs' Municipal Charter) of the same and thereby prohibits the City from conveying any of the publicly dedicated property to a third party without first submitting the matter to an election of the City's voters. Nothing contained herein is intended to limit or prevent the City from developing some or all of the public dedication lands for the use and benefit of the public as the City may deem appropriate and advisable in the future.

The City shall convey to the Owner or its successors-in-interest in providing, at the time of actual dedication of the HP zoned lands, a mutually acceptable, non-specific, easement for the development within the publicly dedicated land of (i) the geotechnical mitigation structures to be constructed and maintained by the Owner, or a special district established by Owner and assigned such responsibility, pursuant to the general description of such structures set forth by the Zoning and

Development Plan application materials provided by High Country Engineering, and maintained in the records of the City, (ii) any reasonable and necessary street and utility easements (i.e. for the connection of Wulfsohn Road between Parcels A and C as set forth by the Plan) and (iii) any reasonable and necessary street or public utility easements connecting Wulfsohn Road to Parcel K of the Property, which streets and/or utility easements shall require the review and approval of the City Council. The actual location of such geotechnical mitigation structures shall require the prior approval of the City, which approval shall not be unreasonably withheld. After completion of the actual construction of such geotechnical mitigation structures and any features attendant thereto (i.e. a Soft Trail), an amended permanent easement, complete with as-built legal descriptions, shall be executed by the parties and recorded in the Garfield County Clerk and Recorder's Office.

All "commonly-owned" parklands and open space within the Parcels A through K, shall be owned and maintained by the Owner and/or the developer thereof, its successors, an association or a special district.

16. Establishment of Special District(s) and Owners' Association/Downtown Development Authority Incorporation Petition.

- (a) Owner agrees that it shall undertake the establishment of a drainage and erosion control special district for the purposes of managing and maintaining in perpetuity all Property drainage and debris flow mitigation functions. The City agrees to join such district to the extent of the City's proportional ownership of land and improvements on the Property which benefit from the geotechnical protections of said structures.
- (b) Owner agrees to form, or have formed, a property owners' association as soon as practicable and agrees to include the City, upon the City's written request, as a third party beneficiary with respect to the association's enforcement of Covenants, Conditions, Restrictions, Declarations or other regulations governing the property owners or common areas within the Property, including but not limited to the ability to impose assessments or penalties for noncompliance therewith. At a minimum, the formed association shall include within in its adopted Covenants, Conditions and Restrictions, the recommendations of the Colorado Division of Wildlife ("CDOW") as set forth by letter dated October 1, 2001 and maintained on file with the City; provided, however, neither the Owner nor any association hereafter formed, shall be responsible for any land dedications or indemnification as referenced in said CDOW letter. In the absence of the prior formation of a special district responsible for the maintenance of debris flow mitigation structures within the Property, either (i) the Owner or (ii) such a property association shall be formed with the specific responsibility for such maintenance obligations.
- (c) Owner agrees that within one (1) year after the effective date of annexation of the Property to the City as described by Section 4 hereof, but in no event later than the filing of the first application for subdivision and/or development, Owner or its successor-in-interest shall petition for inclusion within the boundaries of the Glenwood

Springs Downtown Development Authority (hereafter, the "DDA"). The DDA shall, at its discretion, forward such petition to the City Council for approval or disapproval, in whole or in part, of the request for inclusion. This provision in no way obligates the City to include any or all of the Property in the boundaries of the DDA. Should the City choose not to include all or any part of the Property in the boundaries of the DDA at the time of initial petition by Owner for inclusion, the City shall not be precluded from consideration of the same matter at some point in the future.

17. Provisions Exclusive. The City and Owner acknowledge and agree that this Agreement contains all basic requirements of Owner concerning the provision of water and sewer service to the property, potential joint development of a raw water irrigation system, public open space dedication, and public park land dedication, utilities, infrastructure, water rights dedications and other matters expressly addressed under this Agreement. Additional reasonable specifications and regulations may be imposed by the City upon Owner during the subdivision or development approval processes with regard to these enumerated items as well as other items, as appropriate.

18. Breach by Owner; City's Remedies. In the event of any default or breach by Owner of any term, condition, covenant or obligation under this Agreement, the Owner shall be notified immediately in writing. The City may take such action as it deems necessary to protect the public health, safety, and welfare; to protect lot buyers and builders, and to protect the citizens of the City from any and all damages and/or injury to persons and/or property. The City's remedies include:

- a. The refusal to issue to Owner any building permit or certificate of occupancy; provided, however, that this remedy shall not be available to the City until after the affidavit described in subparagraph b. below has been recorded. This remedy shall not affect sales to bona fide purchasers nor be applied to bona fide purchasers;
- b. The recording with the Garfield County Clerk and Recorder of an affidavit, approved in writing by the City Attorney and signed by the City Manager or his designee, stating that the terms and conditions of this Agreement have been breached by Owner. At the next scheduled Council meeting, the Council shall either approve the filing of said affidavit or direct the City Manager to file an affidavit stating that the breach, or default, has been cured. Upon the recording of such an affidavit, no further lots or parcels may be sold within the Property until the default has been cured. The execution and filing of an affidavit by the City Manager or his designee and approved by the Council stating that the default has been cured shall remove this restriction;
- c. A demand that the security given for the completion of the public improvements be paid or honored;
- d. The refusal to consider further development plans within the Property; and/or
- e. Any other remedy available at law or in equity.



Unless necessary to protect the immediate health, safety, and welfare of the City or City residents, the City shall provide Owner thirty (30) days' written notice of its intent to take any action under this paragraph during which thirty-day period Owner may cure the breach described in said notice and prevent further action by the City. Furthermore, unless an affidavit as described in this paragraph has been recorded with the Garfield County Clerk and Recorder, any person dealing with Owner shall be entitled to assume that no default by Owner has occurred hereunder unless a notice of breach has been served upon Owner as described above, in which event Owner shall be expressly responsible for informing any such third party of the claimed default by the City.

19. Breach By City; Owner's Remedies.

- a. A "breach" or "default" by the City under this Agreement shall be defined as:
- i. any zoning or land use action by the City which would alter, impair, prevent, diminish, impose a moratorium on development, or unreasonably delay the development or use of the Property as set forth in the Zoning and Development Plan, and specifically excluding any non-discriminatory regulatory actions, inaction, or circumstances beyond the reasonable control of the City; or
  - ii. the City's failure to fulfill or perform any material obligation of the City contained in this Agreement.
- b. If any default by the City under this Agreement is not cured as described herein, Owner shall have the right to pursue the defaulting party's remedies allowable by Colorado law, subject to the limitations herein. Although C.R.S. Sections 24-68-101 et seq. allow for certain monetary damages in the event of City breach or default, Owner's sole remedies hereunder shall be to enforce the City's obligations under this Agreement by an action for any available equitable remedy, including, without limitation, specific performance or mandatory or prohibitory injunction. Each remedy provided for in this Agreement is cumulative and is in addition to every other remedy provided for in this Agreement.

20. Miscellaneous.

- a. Expenses. The costs and expenses associated with the recordation of this Agreement shall be paid by Owner.
- b. Waiver of Defects. By executing this Agreement, Owner waives all objections it may have concerning defects, if any, in the formalities whereby it is executed, or concerning the power of the City to impose conditions on Owner as set forth herein, and concerning the procedure, substance, and form of the ordinances or resolutions adopting this Agreement.

c. Final Agreement. This Agreement supersedes and controls all prior written and oral agreements and representations of the parties regarding annexation and zoning of the Property and is the total integrated agreement between the City and Owner as to those limited matters.

d. Modifications. This Agreement shall not be amended, except by subsequent written agreement of the City and Owner.

e. Captions. The captions in this Agreement are inserted only for convenience and in no way define, limit, or prescribe the scope or intent of this Agreement or any part thereof.

f. Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, successors, and assigns. Further, the terms and conditions of this Agreement shall constitute a covenant running with the land.

g. Invalid Provision. If any provisions of this Agreement shall be determined to be void by any court of competent jurisdiction, then such determination shall not affect any other provision hereof, all of which other provisions shall remain in full force and effect. It is the intention of the parties hereto that, if any provision of this Agreement is capable of two constructions, one of which would render the provision void, and the other of which would render the provision valid, then the provision shall have the meaning which renders it valid.

h. Governing Law. The laws of the State of Colorado shall govern the validity, performance, and enforcement of this Agreement. Should either party institute legal suit or action for enforcement of any obligation contained herein, it is agreed that the venue of such suit or action shall be in Garfield County, Colorado.

i. Attorneys' Fees; Survival. Should this Agreement become the subject of litigation between the City and Owner, the prevailing party shall be entitled to attorneys' fees and costs of suit actually incurred, including expert witness fees. All rights concerning remedies and/or attorneys' fees shall survive any termination of this Agreement.

j. Authority. Each person signing this Agreement represents and warrants that he, she or they is/are fully authorized to enter into and execute this Agreement, and to bind the party represented to the terms and conditions hereof.

k. Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original, and all of which, when taken together, shall be deemed one and the same instrument.

l. Notice. All notices required under this Agreement shall be in writing and shall be hand-delivered or sent by facsimile transmission or registered or certified mail, return receipt requested, postage prepaid, to the addresses of the parties herein set forth. All notices by hand delivery shall be effective upon receipt. All facsimile transmissions shall be effective upon transmission receipt. All notices by mail shall be considered effective seventy-two (72) hours after deposit in the United States mail with the proper address as set forth below. Either party by notice so given may change the address to which future notices shall be sent.

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of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

Notice to City:

City of Glenwood Springs  
Michael Copp, City Manager  
806 Cooper Avenue  
Glenwood Springs, CO 81601

With copy to:

Teresa Williams, Esq.  
City Attorney  
806 Cooper Avenue  
Glenwood Springs, CO 81601

Notice to Owner:

Glenwood Meadows, L.L.C.  
Attn: Robert Macgregor  
525 East Cooper  
Aspen, CO 81611

With copy to:

Thomas J. Hartert, Esq.  
802 Grand Avenue, Suite 303  
Glenwood Springs, CO 81601

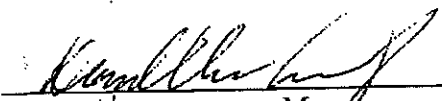
m. Nothing contained herein, or in any Exhibit hereto, shall affect or impair the City's powers of eminent domain or other similar authority.

n. Gender. Whenever the context shall require, the singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

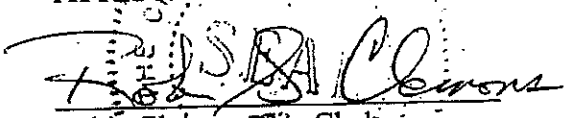
**WHEREFORE**, the parties hereto have executed duplicate originals of this Agreement on the day and year first written above.

**CITY OF GLENWOOD SPRINGS,  
COLORADO**

By

  
DONALD L. VANDERHOEF, Mayor

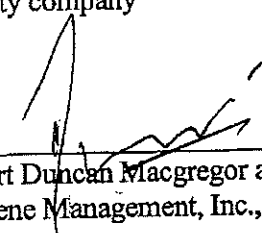
ATTEST

  
Robin Clemons, City Clerk

COLORADO

GLENWOOD MEADOWS, L.L.C., a Colorado  
limited liability company

By

  
Robert Duncan Macgregor as President of  
Dunrene Management, Inc., the Manager

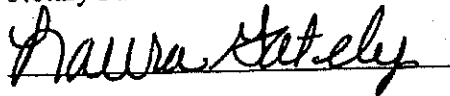
STATE OF COLORADO     )  
                                      ) ss.  
COUNTY OF GARFIELD    )

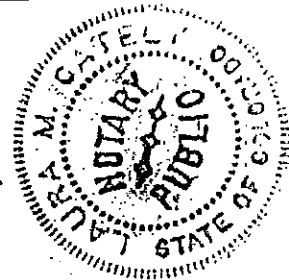
Acknowledged, subscribed, and sworn to before me this 23<sup>rd</sup> day of August, 2002,  
by Donald Underhag, as Mayor, and by Robert S. Clements, as Clerk, on  
behalf of the City of Glenwood Springs, Colorado.

WITNESS my hand and official seal.

My Commission expires: MY COMMISSION EXPIRES 11/28/2005

Notary Public





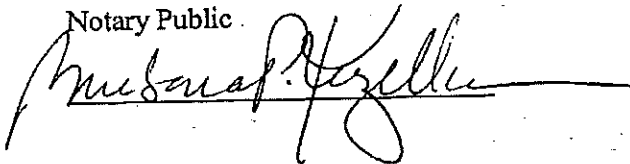
STATE OF COLORADO     )  
                                      ) ss.  
COUNTY OF GARFIELD    )

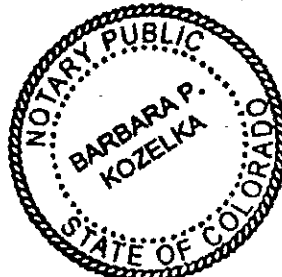
Acknowledged, subscribed, and sworn to before me this 18<sup>th</sup> day of September, 2002,  
by Robert Duncan Macgregor as President of Dunrene Management, Inc., the Manager of  
Glenwood Meadows, L.L.C.

WITNESS my hand and official seal.

My Commission expires: 10/26/2005

Notary Public







516083 12/06/2002 01:20P B1414 P553 M ALSDORF  
of 83 R 416.00 D 0.00 GARFIELD COUNTY CO

### LIST OF EXHIBITS

|           |                                                         |
|-----------|---------------------------------------------------------|
| Exhibit A | Property Description (from Annexation Plat – 345 acres) |
| Exhibit B | Zoning Map                                              |
| Exhibit C | Zoning and Development Plan                             |



# EXHIBIT "A"

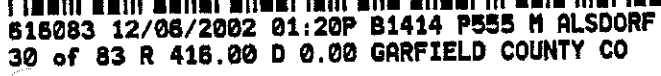
## ANNEXATION DESCRIPTION

A PARCEL OF LAND SITUATED IN THE S1/2S1/2 OF SECTION 5, THE SE1/4SE1/4 OF SECTION 6, THE NE1/4NE1/4 OF SECTION 7, THE N1/2 OF SECTION 8 AND THE NW1/4NW1/4 OF SECTION 9, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE SIXTH PRINCIPAL MERIDIAN; SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 5, THE POINT OF BEGINNING; THENCE S75°55'37"W A DISTANCE OF 1316.16 FEET; THENCE N01°07'55"E A DISTANCE OF 582.48 FEET; THENCE N90°00'00"E A DISTANCE OF 1265.15 FEET; THENCE S30°38'55"E A DISTANCE OF 522.34 FEET; THENCE S19°31'13"E A DISTANCE OF 160.53 FEET; THENCE S12°53'54"E A DISTANCE OF 181.17 FEET; THENCE N47°17'45"E A DISTANCE OF 1171.28 FEET; THENCE ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 1260.00 FEET AND A CENTRAL ANGLE OF 10°27'43", A DISTANCE OF 230.07 FEET (CHORD BEARS N65°22'14"W 229.75 FEET); THENCE N63°26'47"E A DISTANCE OF 283.45 FEET; THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 137.50 FEET AND A CENTRAL ANGLE OF 24°20'19", A DISTANCE OF 58.41 FEET (CHORD BEARS N51°16'35"E 57.97 FEET); THENCE N63°30'55"E A DISTANCE OF 61.83 FEET; THENCE S70°03'24"E A DISTANCE OF 42.54 FEET; THENCE N19°35'36"E A DISTANCE OF 75.00 FEET; THENCE N70°03'24"W A DISTANCE OF 522.96 FEET; THENCE ALONG THE ARC OF A CURVE TO THE LEFT HAVING A RADIUS OF 337.50 FEET AND A CENTRAL ANGLE OF 28°23'27", A DISTANCE OF 187.24 FEET (CHORD BEARS N84°15'08"W 165.53 FEET); THENCE S81°33'05"W A DISTANCE OF 198.69 FEET; THENCE ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 1260.00 FEET AND A CENTRAL ANGLE OF 01°42'55", A DISTANCE OF 37.72 FEET (CHORD BEARS N31°49'38"W 37.72 FEET); TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY OF MIDLAND AVENUE; THENCE N62°28'35"E ALONG SAID RIGHT-OF-WAY A DISTANCE OF 262.30 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N70°48'52"E A DISTANCE OF 233.79 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 400.00 FEET AND A CENTRAL ANGLE OF 19°48'21", A DISTANCE OF 138.27 FEET (CHORD BEARS N80°43'04"E 137.58 FEET); THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S89°22'47"E A DISTANCE OF 220.22 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S04°05'51"W A DISTANCE OF 84.94 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S88°21'25"E A DISTANCE OF 29.12 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N84°12'24"E A DISTANCE OF 200.33 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N13°23'18"E A DISTANCE OF 18.04 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S79°22'12"E A DISTANCE OF 693.85 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S15°25'14"W A DISTANCE OF 81.35 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S72°50'58"E A DISTANCE OF 30.90 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S87°49'17"E A DISTANCE OF 164.69 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N47°19'34"E A DISTANCE OF 37.65 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S74°59'10"E A DISTANCE OF 294.83 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S08°06'53"E A DISTANCE OF 62.58 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S77°46'27"E A DISTANCE OF 150.75 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N14°20'16"E A DISTANCE OF 62.19 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S79°08'31"E A DISTANCE OF 369.05 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S18°40'31"E A DISTANCE OF 29.17 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S66°03'20"E A DISTANCE OF 143.01 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N25°40'28"E A DISTANCE OF 42.89 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S74°19'33"E A DISTANCE OF 339.00 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S76°23'22"E A DISTANCE OF 559.87 FEET; HAVING A RADIUS OF 1190.00 FEET AND A CENTRAL ANGLE OF 53°10'47", A DISTANCE OF 1104.51 FEET (CHORD BEARS S48°18'54"E 1065.29 FEET); THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S21°43'32"E A DISTANCE OF 179.05 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S68°16'28"W A DISTANCE OF 31.36 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S23°26'58"E A DISTANCE OF 78.05 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY N68°16'28"E A DISTANCE OF 29.01 FEET; THENCE CONTINUING ALONG SAID RIGHT-OF-WAY S21°43'32"E A DISTANCE OF 613.97 FEET; THENCE LEAVING SAID RIGHT-OF-WAY S82°49'19"W 292.63 FEET; THENCE ALONG THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 760.00 FEET AND A CENTRAL ANGLE OF 24°24'13", A DISTANCE OF 323.70 FEET (CHORD BEARS S75°01'26"W 321.26 FEET); THENCE S27°10'41"E 147.90 FEET; THENCE S82°49'19"W A DISTANCE OF 281.27 FEET; THENCE S16°27'24"E A DISTANCE OF 1206.11 FEET; THENCE N89°15'16"W A DISTANCE OF 3719.58 FEET; THENCE N01°13'52"E A DISTANCE OF 1360.08 FEET; THENCE N88°45'05"W A DISTANCE OF 1367.66 FEET; THENCE N01°04'58"E A DISTANCE OF 1369.90 FEET; TO THE POINT OF BEGINNING; SAID PARCEL CONTAINING 344.473 ACRES, MORE OR LESS.

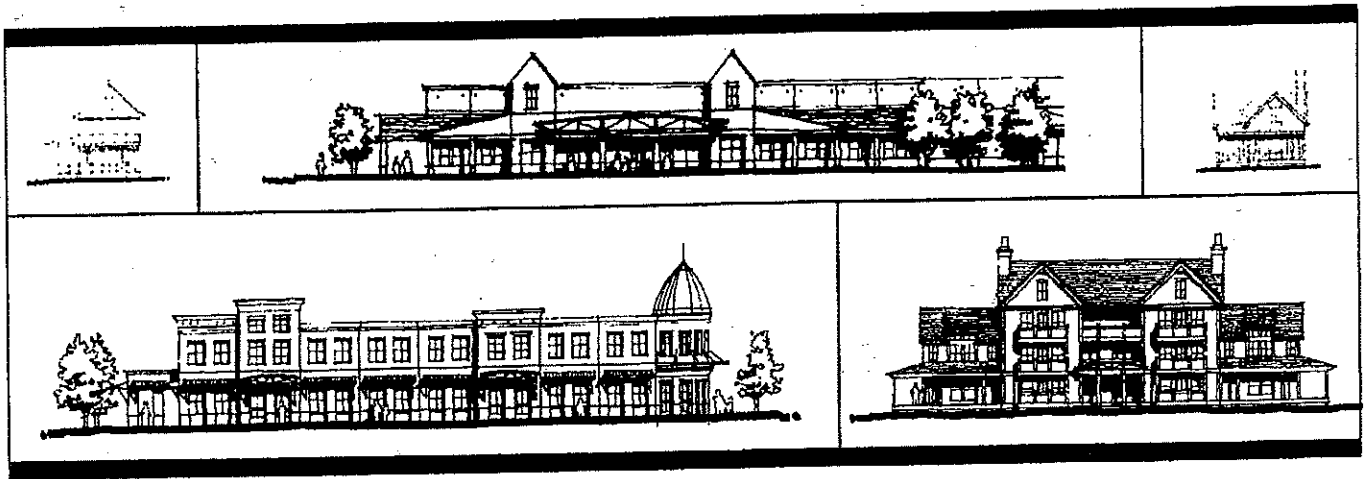


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# **ZONING AND DEVELOPMENT PLAN**

## **GLENWOOD MEADOWS**



*Glenwood Meadows, LLC*

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Introduction

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# **I. Introduction**

## **A. PROJECT BACKGROUND**

Glenwood Meadows is an approximately 345-acre parcel of unincorporated land surrounded on three sides by the municipal limits of Glenwood Springs, Colorado ("City"). The Midland Alternate Route, a 100 foot wide public right-of-way, serves as the northern border to the site and two new City facilities are under construction on the east and west ends; a new community center to the east of Glenwood Meadows and a municipal operations facility to the west of the site. While Red Mountain serves as a backdrop to the site on the south, it is not owned by or a part of the Glenwood Meadows' zoning application and development plan. The subject property, which is owned by Glenwood Meadows, L.L.C. was historically referred to as the "Wulfsohn" property.

Glenwood Meadows is situated west of the core of Downtown Glenwood Springs and directly across the Colorado River from the significant neighborhoods and commercial operations of West Glenwood. Glenwood Meadows and the City's Community Center are highly visible from Interstate 70, the primary entry point to the City from both the east and the west. Despite its juxtaposition with the City, Exit 114 to Interstate 70, the Midland Alternate Route and the two City facilities mentioned, Glenwood Meadows currently resides in the jurisdiction of Garfield County, Colorado. Prior to the completion of the Midland Alternate Route and the City's adoption of its Land Use Plan, annexation of the land was not feasible.

When the oil shale industry collapsed in the early 1980's, the then owner of the site, Union Oil Company, considered various development options. In the mid-1980s, Union Oil Company and the City of Glenwood embarked on negotiations for the joint development of the site as a municipal golf course, residential and commercial venture. The efforts failed, as did two subsequent attempts to pass open space and recreation tax measures aimed at the City's ability to purchase portions of the site.

In 1996, Glenwood Land Company, LLC purchased the property from the Union Oil Company. Approximately two years later Glenwood Meadows, LLC, the current owner of the property, acquired the land. Shortly thereafter, Glenwood Meadows undertook a land exchange with the City of Glenwood Springs, which provided the city with 37.24 acres for use as a Community Center. The city subsequently annexed the Community Center site and has provided a public access point to the property, which is currently under construction. This access point will be shared when the remaining property is developed. In early 2000, the City of Glenwood Springs and Glenwood Meadows undertook another land transaction by which the city acquired an additional 35.57 acres for development of a Municipal Operations Center (MOC). The MOC site was thereafter annexed and the City created a second public access point to Glenwood Meadows, which is also under construction. In addition to the City development of the MOC facility, the site west of Glenwood Meadows is also planned to provide the base operational facility for the newly organized Rural Transportation Authority ("RTA").

Regardless of how Glenwood Meadows is developed (i.e. for residential, commercial, mixed-use purposes, through the jurisdiction of either Garfield County or the City), Glenwood Meadows is entitled to use both City developed access points as well as two other access points along the Midland Route. Further, Glenwood Meadows has legal rights to utilize the City's municipal sewer and potable water systems.

For the past two years the City and Glenwood Meadows have mutually expressed their desire to annex the land to the City and to subject the property to stringent criteria which would result in the highest quality of future development specifically planned to address the present and future needs of the community as a whole. Through extensive discussions with City staff, it was determined that seeking "enhanced" traditional zoning for the property (traditional zoning with additional development standards and more restrictive uses) would be a more effective tool than the P.U.D. process to achieve the highest quality of future development. This decision was based on the fact that through the traditional zoning process; additional development standards and use restrictions could be applied to traditional zone districts in order to achieve a high level of development quality without the unnecessary analytical and administrative confusion of a cumbersome P.U.D. process. This Zoning Plan, together with the associated Annexation and Development Agreement and the additional information provided represents the culmination of these efforts.

## **B. STATEMENT OF PURPOSE AND INTENT**

This Zoning Plan is intended to serve as a supporting document for the accompanying Annexation Agreement in order to establish appropriate zoning for the 12 individual development parcels within the overall site. In addition, the Zoning Plan establishes standards for the property to ensure that future planning and construction quality remains high, regardless of the phasing of development on different parcels. The following goals serve as the basis for this Zoning Plan and development standards. The goals were identified during an unprecedented and invaluable public hearing process, through community meetings dating back to the original adoption of the City's Comprehensive and Land Use Plans, during work sessions with City staff, citizen committees, the Planning Commission, and City Council members as items to be addressed by this Zoning Plan.

### **Land Use**

- *Promote Glenwood Springs as the governmental hub and the local/tourism service center of the Roaring Fork and Colorado River Valleys.*
- *Establish Glenwood Meadows not as a development, but as a new Glenwood Springs neighborhood with housing opportunities, jobs, shopping, hospitality, and recreation.*
- *Enhance the City's Community Center project through placement of adjacent zoning for uses that include active and passive open areas as well as for tourism and hospitality.*

### **Development Quality**

- *Preserve, maintain, and enhance the visual qualities of the west entrance to Glenwood Springs.*
- *Focus neighborhood retail around pedestrian-oriented streets to break up larger commercial uses.*
- *Provide development standards that supplement from the City's standard development regulations, encouraging creative, quality design.*

### **Housing**

- *Provide a mix of housing types and densities within the Glenwood Meadows neighborhood.*

### **Open Space and Natural Amenities**

- *Balance the quantity of development on the site with the natural characteristics of the site.*
- *Maximize dedicated open space and integrate open space corridors throughout the Glenwood Meadows neighborhood, minimizing impacts to existing site vegetation.*

#### Transportation

- *Encourage the allocation of future traffic west of the core Downtown and provide a West Glenwood mass transit option.*
- *Promote directed investment, through any development, aimed at the restoration and enhancement of the City's transportation infrastructure through adoption of an Off-Site Transportation Improvements Fee Program.*

### C. RELATIONSHIP TO GLENWOOD SPRINGS COMPREHENSIVE PLAN

#### Vision

The Glenwood Springs Comprehensive Plan provides the community with a tool for managing its long-term growth and character. Ensuring that the goals and ideals of the Comprehensive Plan were addressed was a critical component of this zoning plan. The following excerpt from the City's Vision Statement outlined in the Comprehensive Plan echoes the overall development vision for Glenwood Meadows.

*"The City of Glenwood Springs desires to maintain its small town character and preserve its cultural and natural resources...to achieve directed and balanced development, social and economic diversity and address its transportation needs."*

#### Maintaining Small Town Character

Today, the City consists of a series of individual neighborhoods. While these neighborhoods vary in their size, appearance, and mix of uses, they all function as part of the greater community; each providing different types of housing, shops, employment, and recreational opportunities. This proposed zoning plan focuses on establishing Glenwood Meadows as a new and independent neighborhood that contributes to the small-town character of Glenwood Springs and community need for housing and commercial services. Keeping this appealing character and scale in mind, the plan is focused around a central retail core designed to invoke an intimate, pedestrian-oriented feeling enhanced by plazas, seating areas, and public art. These smaller retail uses will flank the center's two regional commercial anchors along Market Street and Wulfsohn Road, helping to create a more inviting and active space. Other spaces along Wulfsohn will provide offices and additional neighborhood-type retail to serve the adjacent neighborhoods, which will provide a variety of housing types and prices, ranging from apartments to town homes, duplexes, and single-family homes. The plan has been designed so that none of the residences are located farther than ¼ mile away from the retail core, which will give the neighborhood a friendly, walk able scale similar to that found in many of Glenwood's existing neighborhoods. A small employment campus will also contribute to the "small town" feeling of the neighborhood, providing the opportunity for individuals to live near their jobs, reducing commute time and local traffic. Hospitality uses are located across from the new Community Center where both will be easily accessed by adjoining neighborhoods and downtown. Each of the uses identified in the proposed zoning plan has been specified within the Land Use Plan as an appropriate "Regional Use", as designated for the Glenwood Meadows site.

#### Preserving Natural Resources

Another core community value that has been integrated into the development plan is the careful treatment of the site's natural resources. In fact, approximately 215 acres, or +/- 62 percent of the site will be dedicated as open space and parkland, providing recreational opportunities, such as hiking trails or a public golf venue. The public dedication of this significant parcel of land is specifically designed to provide direct public access to the area through sections of major contiguity with existing publicly owned property at the Community Center and MOC sites. The dedication land



also specifically provides direct connection to the surrounding BLM land adjacent to it in compliance with the direction of the Glenwood Springs Comprehensive Plan.

The site's topography and dramatic Red Mountain backdrop make it highly visible from major roadways, such as I-70, State Highway 6&24 and the Midland Alternate Route as each enters Glenwood Springs from the east and west. Glenwood Meadows is also visible from other areas of Glenwood Springs where a higher elevation provides a birds-eye vantage of the site. A thick Gambel Oak stand, which blankets the upper 2/3's of the site providing scenic value and wildlife habitat, is another of the site's significant natural features. Each of these factors was given strong consideration in the development of the proposed zoning plan. As a result, the residential neighborhoods at the southern edge of the site have been focused below the 6000-foot Urban Development Boundary contour. Not only does this protect the scenic quality of the site, but also leaves much of the Gambel Oak stand intact.

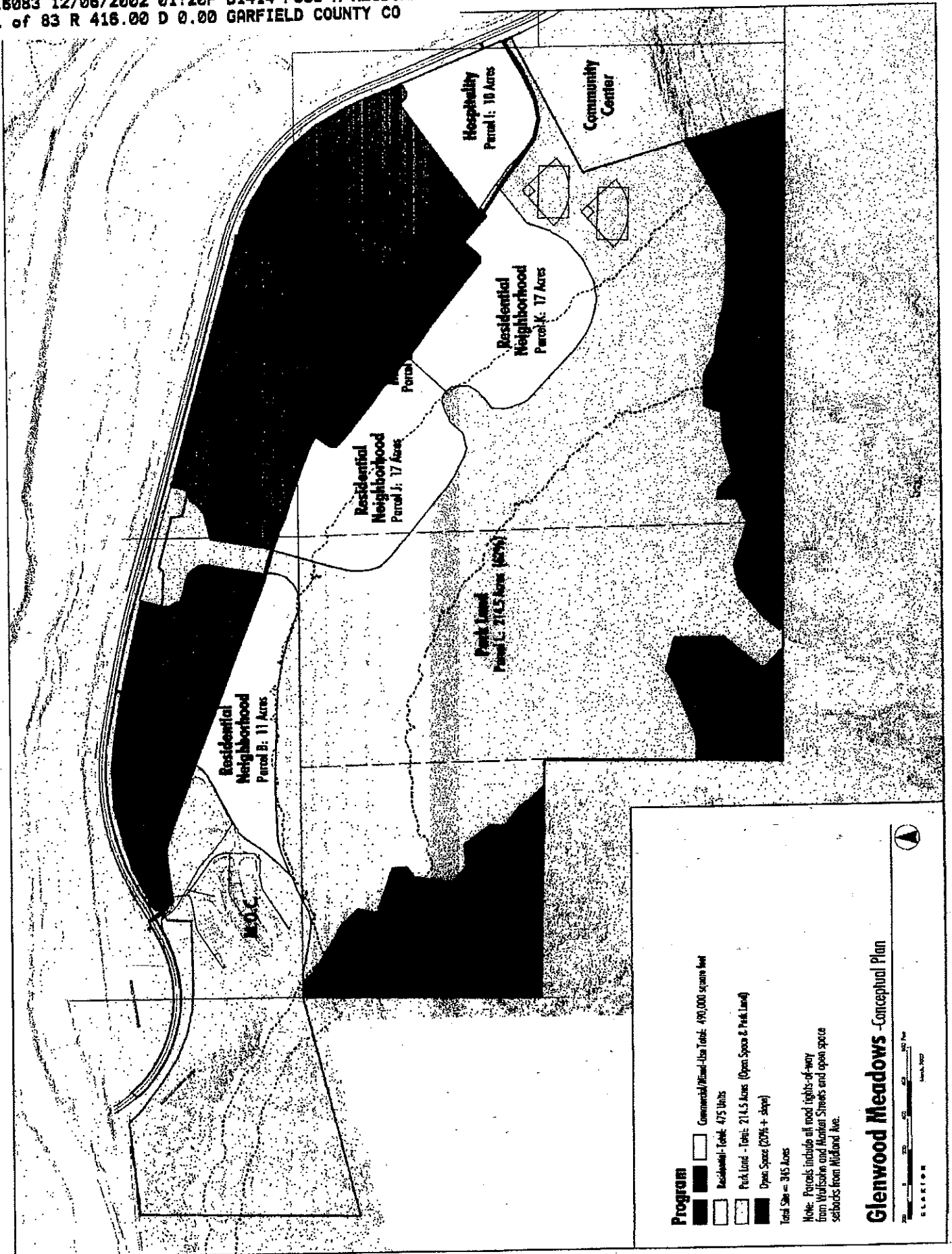
### **Addressing Transportation Needs**

Transportation is another component of the Land Use Plan that was an important consideration during the development of the zoning plan. The plan strives to provide a mix of uses within a walk able proximity of one another to minimize short automobile trips. However, it is acknowledged that some uses, such as the retail and employment components will draw from a more regional customer base, generating additional trips along the Midland Alternate Route. Perhaps more significant, though, is that the location of the site on the western fringe of Glenwood Springs will be serving a market that currently must travel through downtown along the often congested Grand Avenue to reach similar uses on the south side of town, or even further south in neighboring communities, potentially minimizing the need for many of these cross-town trips. The project will provide funding for several necessary road improvements along the Midland Alternate Route that will result in improved future traffic conditions. The specifics of this are addressed in the Annexation Agreement. With these proposed road improvements, an efficient traffic flow would be maintained. In addition, the compact form of the development plan was conceived with the intention of being able to efficiently incorporate future bus service and future regional rail connections into the community. The plan provides the flexibility, not to exceed 2.5 acres, at the west end of Parcel A for the construction of a park and ride/transit facility. The park and ride would be complemented by the site's retail uses and the potential for limited shared parking where appropriate.

## **II. Authority**

These standards shall apply to all property contained within the approved Glenwood Meadows Annexation Plat and the Annexation Agreement. The regulations and requirements shall become the governing standards for review, approval, and modification of all development activities occurring on the Glenwood Meadows site. Provisions of this guide shall prevail and govern the development of Glenwood Meadows superseding existing zoning ordinances. The proposed zoning regulations and design standards are intended to be more restrictive than the underlying Municipal Code standards. The Glenwood Springs zoning ordinance shall apply where the provisions of this guide do not address a specific subject.

### III. Zoning Map



## IV. Zoning Districts

There are 12 distinct parcels within Glenwood Meadows. Each of these parcels falls within one of 5 zoning categories according to the City of Glenwood's Zoning Ordinance: Multi-family Residential District (R-3), Limited Commercial District (C-1), Core Commercial District (C-2), Resort District (C-4), and Hillside Preservation (HP). The actual boundaries of the parcels may be modified during the preliminary and final design of each area, prior to approval by the City. A table of prohibited uses for each zone district is provided in the Appendix of this document.

The following table provides a brief summary of each zoning category as it applies to individual parcels identified on the zoning map on the following page:

| Parcel                                | Zoning | Acreage | Percentage |
|---------------------------------------|--------|---------|------------|
| A (Mixed-Use Campus)                  | C-1    | 20      | 6%         |
| B (Residential Neighborhood)          | R-3    | 11      | 3.25%      |
| C (Commercial)                        | C-1    | 11      | 3.25%      |
| D (Commercial)                        | C-1    | 12      | 3%         |
| E (Mixed-Use)                         | C-2    | 7.5     | 2%         |
| F (Mixed-Use)                         | C-2    | 7       | 2%         |
| G (Mixed-Use)                         | C-2    | 5       | 1.5%       |
| H (Commercial)                        | C-1    | 13      | 4%         |
| I (Hospitality)                       | C-4    | 10      | 3%         |
| J (Residential Neighborhood)          | R-3    | 17      | 5%         |
| K (Residential Neighborhood)          | R-3    | 17      | 5%         |
| L (Open Space)                        | HP     | 214     | 62%        |
| TOTAL:                                |        | 345     |            |
| Residential Total: 475 units          |        |         |            |
| Commercial Total: 490,000 square feet |        |         |            |

\*Acreages are subject to change upon completion of final legal descriptions.

\*Parcels include all road-rights-of way and open space setbacks from Midland Avenue.

## V. General Development Standards

### A. GENERAL INTENT

The intent of these General Development Standards is to establish an indigenous style and high level of development quality for Glenwood Meadows that is derived from and builds upon established neighborhoods in Glenwood Springs. These standards set the framework for a new, mixed-use neighborhood that strives to incorporate the most desirable features of Glenwood's most appreciated areas, such as the downtown core and its attractive, pedestrian-friendly residential neighborhoods. In order to identify these desirable features, existing neighborhoods and developments throughout Glenwood Springs and the Western Slope were evaluated and "dissected" for successful site and building design elements. The result of this evaluation are these standards for character defining features such as appropriate building mass, scale, and materials based on lessons learned, both positive and negative. The standards also establish a cohesive pedestrian and vehicular circulation network within and between neighborhoods, a unified landscape theme for streetscapes and common open space areas, and general standards for parking, and signage. These standards have been developed to provide an additional level of quality to Glenwood Meadows, not required within the City Code, and will be applied in addition to those existing standards.



### B. APPLICABILITY

These General Development Standards shall apply to all development within Glenwood Meadows, including C-1 (Commercial), C-2 (Mixed Use), C-4 (Hospitality), and R-3 (Mixed-Use Campus and Residential Neighborhoods). These standards shall be applied in addition to standards outlined in the City of Glenwood Springs Municipal Code.

### C. SITE LAYOUT AND DEVELOPMENT PATTERN

#### 1. Intent

The intent of these standards is to ensure that all non-residential and residential development on the site works creatively within the site's natural constraints, such as slope, geologic hazards, and significant vegetation.

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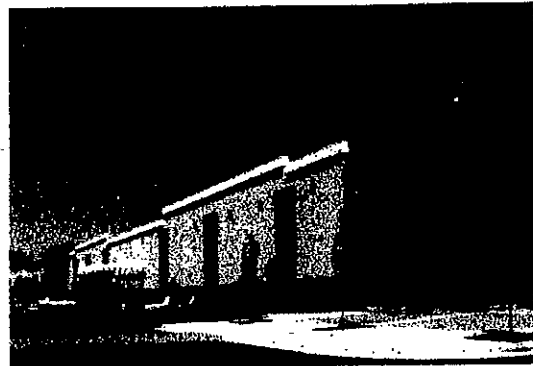
## 2. General

- a) The siting of all buildings shall respond to existing site features to minimize the need for retaining walls, excavation, and other unnecessary site disturbances. Non-residential zones are purposefully located near primary roads on land with lesser degrees of slope.

## D. BUILDING DESIGN

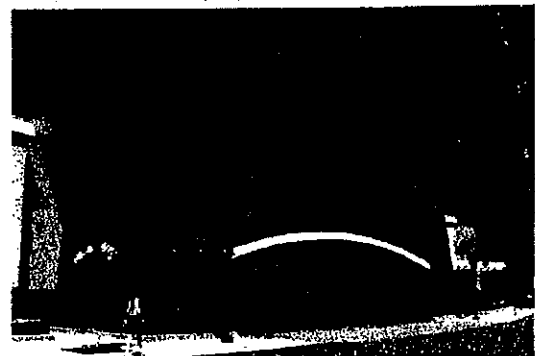
### 1. Intent

These standards are intended to encourage creative, quality commercial and residential building design that utilizes a variety of design techniques to break up larger building masses and emphasizes a pedestrian orientation at the street level.



### 2. Non-Residential

- a) No single-user building footprint shall exceed a maximum of 130,000 square feet of enclosed floor area, nor shall the total useable area of any one user exceed 130,000 square feet.
- b) Buildings shall have recessed, highly visible customer entrances that feature no less than 2 of the following:
  - (1) Canopies or porticos;
  - (2) Overhangs, recesses/projections;
  - (3) Arcades;
  - (4) Distinctive roof forms;
  - (5) Arches;
  - (6) Outdoor patios;
  - (7) Display windows;
  - (8) Planters or wing walls that incorporate landscaped areas and/or places for sitting.
- c) For buildings less than 60,000 square feet, two or more of the following design elements shall be incorporated for each 30 horizontal feet of a building façade or wall. For buildings equal to and greater than 60,000 square feet, two or more of the following elements shall be incorporated for each 50 horizontal feet of a building façade or wall:
  - (1) Changes in color, texture, or materials;
  - (2) Projections, recesses, and reveals, expressing structural bays, entrances, or other aspects of the architecture with a minimum change of plane of 4-6 inches;
  - (3) Arcades or pergolas providing pedestrian interest;
  - (4) Trellises with vines, or
  - (5) An equivalent element that subdivides the wall into human scale proportions.
- d) Building facades or walls that face public



streets, adjacent developments, or connecting pedestrian frontage shall be subdivided and proportioned along 60% of their horizontal length using features such as:

- (1) Windows;
  - (2) Entrances;
  - (3) Arcades;
  - (4) Awnings; or
  - (5) Other such features.
- e) Parapet walls shall be incorporated when a flat roofline is required. The design or height of the parapet shall include a minimum of one change in setback or height along each 60 lineal feet of façade.
- f) Sloping roofs shall have a minimum of one of following elements incorporated into their design for each 60 lineal feet of roof:
- (1) Projecting gables;
  - (2) Hips;
  - (3) Horizontal/vertical breaks; or
  - (4) Other similar techniques.
- g) Sloping roofs shall be integrated into the building architecture and shall be consistent with the characterized architectural style.
- h) Sloping roofs shall be used at entries and other prominent features to add prominence. Other features intended to accent entries may be considered.
- i) Intense, bright, or fluorescent colors shall not be used on any roof area visible from a public or private right-of-way or open space.

### 3. Residential

- a) A building's special architectural features and treatments shall not be restricted to a single façade. All sides of a multi-family building open to view by the public, whether viewed from public or private property, shall display a similar level of quality and architectural interest.
- b) All multi-family buildings shall be designed to provide complex massing configurations with a variety of different wall planes and roof planes. Plain, monolithic structures with long, monotonous, unbroken wall and roof plane surfaces are prohibited. At least every 50 linear feet, wall planes shall contain offsets or setbacks with a differential in horizontal plane of at least 5 feet.
- c) The maximum length of a multi-family building shall be 125 feet.
- d) All elevations on multi-family buildings shall contain windows.



An eave or overhang of at least 12-inches shall be provided on the perimeter of all residential buildings, except gable roof ends, where an 8-inch overhang shall be required.  
For additional specificity, see Section X.

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## E. BUILDING MATERIALS

### 1. Intent

The intent of these standards is to establish a palette of high-quality building materials to be used to add texture, color, and visual interest to the overall development.

### 2. Non-Residential

- a) One or more of the following building materials shall be incorporated into a structure's design:

- (1) Stucco;
- (2) EIFS (Exterior Insulation and Finish Systems);
- (3) Brick;
- (4) Stone (cultured and natural);
- (5) Tinted, textured and integral color masonry block.

- b) Exterior building materials shall not include the following:

- (1) Smooth-faced gray concrete block, painted concrete block, tilt-up concrete panels;
- (2) Field-painted or pre-finished standard corrugated metal siding; or
- (3) Standard single or double tee concrete systems.

- c) Ribbed metal siding is prohibited as a primary exterior surface material. It may be used as trim material covering no more than 10% of the façade.

- d) Exterior building material shall be continued down to within 9 inches of finished grade on any elevation.

- e) High-intensity primary, metallic, or fluorescent colors are prohibited on any roof area visible from any public or private property.

- f) All sloping roof areas with a pitch of 3:12 or greater, and visible from any public or private right-of-way, shall be surfaced with attractive and durable materials such as:

- (1) Concrete, clay, or slate tiles; or
- (2) Seamed architectural metals such as tin or copper; or
- (3) Asphalt shingles.



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### 3. Residential

- a) One or more of the following building materials shall be incorporated into a structure's design:

- (1) Split shakes;
- (2) Rough-sawn wood; or
- (3) Board and batten wood.

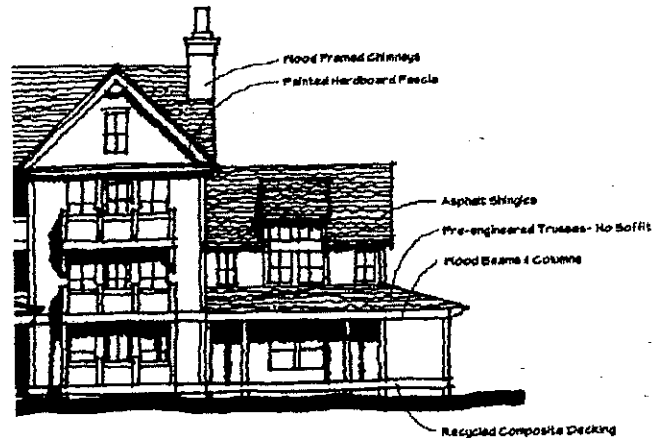
- b) Exterior building materials shall not include the following:

- (1) Concrete block (including split face and ground face block), or

- c) High-intensity primary, metallic, or fluorescent colors are prohibited on any roof area visible from any public or private property.

- d) All sloped roofs visible from the ground or from a surrounding property shall be clad with one of the following:

- (1) High profile composition shingles; or
- (2) Seamed architectural metals.



## F. VEHICULAR AND PEDESTRIAN CIRCULATION AND ACCESS

### 1. Intent

The intent of these standards is to create a hierarchy of streets within Glenwood Meadows that efficiently facilitate traffic flow, yet are designed to discourage speeds and volumes that impede pedestrian activity.

### 2. Vehicle Access and Circulation

- a) Traffic calming devices, such as bulb-outs or curb extensions, traffic calming circles, and narrower street widths shall be used in residential neighborhoods to discourage through traffic and excessive speeds.
- b) To the maximum extent feasible, common or shared service and delivery access shall be provided between adjacent parcels and/or buildings.
- c) Internal vehicle circulation patterns shall provide a clear and direct path to the principal entrance of the primary building, to outlying pad sites where applicable, and to each parking area.
- d) Internal vehicle circulation patterns shall provide the most direct vehicular route(s) between the development site's main entrance and the primary building's main customer entrance.
- e) Main drive aisles shall be continuous and connect to the main entrance to the development site.



- f) Internal intersections shall have adequate sight lines, design geometrics, and/or traffic controls to minimize accident potential.

### 3. Pedestrian Access and Circulation

- a) Continuous sidewalks or trails shall provide connections to and between:
  - (1) The primary entrance or entrances to each building, including pad site buildings;
  - (2) All parking lots or parking structures that serve such buildings;
  - (3) Any sidewalks or walkways on adjacent properties that extend to the boundaries shared with the development;
  - (4) Any public sidewalk system along the perimeter streets adjacent to the development;
  - (5) Adjoining land uses;
  - (6) Any greenway on or adjacent to the property; and
  - (7) Other community amenities or gathering spaces.
- b) Covered shelters shall be provided at transit shuttle sites in locations as determined by the landowner and the City.



## G. PARKING

### 1. Intent

The intent of these standards is to minimize the visual impacts of large blocks of parking, both from within the development and from other areas of Glenwood Springs that, because of their higher elevation, view Glenwood Meadows from above, by breaking it into a series of smaller "rooms". These rooms may be defined by landscaped medians, pedestrian walkways, or tree plantings.

### 2. General

- a) Parking quantities shall be no less than current city requirements, unless specifically noted otherwise.
- b) Structured parking is strongly encouraged. Incentives shall be provided to the maximum extent feasible.
- c) To the maximum extent feasible, parking shall be distributed between the front, sides, and rear of a building to further break up large parking areas.
- d) In addition to the above standard, the visual appearance of parking blocks shall be further mitigated through the establishment of a shady canopy created by orchard plantings or regularly spaced tree diamonds within each parking block.
- e) The use of terracing to further break up parking areas is strongly encouraged where grade changes allow. Where terracing is utilized, the standards for retaining walls and





terracing outlined in Section V.H.6, shall be applied.

- f) The above standards shall be applied in addition to the standards outlined in Section V.H. Landscaping and Screening.

## H. LANDSCAPING AND SCREENING

### 1. Intent

The intent of these standards is to provide a high quality appearance for building sites, rights-of-way, parks, and open spaces within Glenwood Meadows. These standards exceed City of Glenwood requirements in some cases in order to enhance the appearance and pedestrian-oriented feeling of all development in Glenwood Meadows. For instance, additional landscape coverage is required for parking areas in order to ensure that the visual impacts of parking on this highly visible site are adequately mitigated by generally improving the appearance of these areas from both within the site and from surrounding neighborhoods with a birds-eye view of Glenwood Meadows. In addition, the spacing of required street tree plantings are significantly smaller than those required in the City Code. This again, is intended to further enhance the appearance of the overall project and to create an inviting environment for pedestrians.



### 2. General

- a) All landscape areas shall comply with City of Glenwood Springs Municipal Code in addition to these regulations.
- b) Landscape architectural design elements shall relate to the physical site and built structures. A combination of evergreen plantings and other landscape elements, as defined in Table 1-Landscape Requirements, shall be used to screen and buffer service areas, mechanical features and break up large lengths of building walls.
- c) Unless prohibited by a particular site's geologic mitigation requirements, building foundations shall be planted with ornamental plant material, such as ornamental trees, flowering shrubs and perennials, and ground covers and shall include a variety of plant materials to provide year round interest.
- d) Development entryways shall be planted with ornamental plant material, such as ornamental trees, flowering shrubs and perennials, and ground covers.
- e) Planting shall be massed and scaled as appropriate for the entryway size and space.
- f) Landscaping shall break down in scale and increase in detail, color, and variety to mark entryways into developments.
- g) All turf areas within individual sites shall be established by sodding. Un-manicured natural areas may be seeded when adjacent to open space as a transition to turf areas.
- h) Due to the site's soil conditions and the arid nature of the Glenwood climate, xeric or low-water plant materials shall be required.
- i) The use of the following xeriscape principles shall be required:

- (1) Grouping plants with similar water requirements together;
  - (2) Utilizing mulch and soil amendment to reduce irrigation requirements;
  - (3) Utilizing drip irrigation where possible to minimize run-off from sprinklers; and
  - (4) Restricting the amount of water consumptive sod.
- i) Irrigation systems shall be professionally designed to limit water consumption. The use of moisture sensors to reduce water consumption shall be encouraged.
  - k) Each owner or owner's association shall be responsible for the maintenance and repair of all site landscaping, including common open space areas.
  - l) Landscaping and maintenance shall comply with the Glenwood Meadows Geotechnical Mitigation Requirement.

### 3. Streetscape Improvements

- a) Landscaping, decorative paving, and/or other site amenities shall be required to promote and enhance a comfortable pedestrian scale and orientation of the property.
  - b) The property between curb and the adjacent property line shall be landscaped according to Table 1-Landscape Requirements or paved with decorative paving in heavily used pedestrian areas, such as Market Street and Wulfsohn Road, or be treated with some combination of the two alternatives. Approval of all paving materials shall be subject to review by the Architectural Review Committee.
- 
- c) Streetscape shall be developed in a consistent manner and be reviewed as part of the overall development permit, if areas within the pod are developed separately, the design shall be consistent with that previously approved.
  - d) Trees selected from the plant list in this document shall be required within the back of curb landscaping strip. Such trees shall be planted every 40 feet maximum on center or depending on species at some other distance to ensure their proper spacing so as to develop a continuous canopy when mature.
  - e) Streetscape plantings shall be provided according to Table 1-Landscape Requirements. Variations in the tree species used from street to street are encouraged to avoid creating monocultures of trees. Landscape in the right-of-way and on individual sites is subject to review by the City of Glenwood Springs and any Design Review Committee of an owner's association.

### 4. Site Furnishings

- a) Site furnishings, including, but not limited to: benches, seating, trash receptacles, bike racks, lighting fixtures and tree grates shall be incorporated with the theme of the building's architecture. All materials shall be considered and approved by any Design Review Committee of an owner's association and be in conformance with the City of Glenwood Springs Standards and these regulations.

## 5. Parking Lot Landscaping

- a) For lots with less than 20 spaces, a minimum of 10 percent of the total uncovered parking area, including access ways, shall be devoted exclusively to landscaping. For lots with twenty or greater spaces, a minimum of 20 percent of the total uncovered parking area, including access ways, shall be devoted exclusively to landscaping.
- b) Required parking area interior landscaping shall be distributed in such a configuration so as to divide groups of parking spaces. No grouping of parking spaces shall exceed 8 in a row.
- c) Parking lot edges shall be screened from public streets and sidewalks, public open space, and adjacent properties.
- d) Landscaped islands shall be planted with ground cover or sod and a minimum of 2 deciduous trees (minimum caliper of 3 inches) per 200 square feet of landscaped island area.
- e) Where a landscaped setback of at least 25 feet is not present, the perimeter of all parking lots shall be screened from adjacent streets, public sidewalks, and adjacent uses, with the exception of the area reserved as a site triangle at intersections, by either of the following methods:
  - (1) A berm 3 feet high with a maximum slope of 2:1 in combination with coniferous and deciduous trees and shrubs, as specified in table V.H.9.a, or
  - (2) A low continuous landscaped hedge at least 3 feet high consisting of a double row of shrubs planted 3 feet on center in a triangular pattern; or
  - (3) A low decorative masonry wall at least 3 feet high in combination with landscaping; or
  - (4) A combination of any of these methods.
- f) Non-living ground cover, such as wood, bark, and rock mulches, decorative stone, brick or concrete paving, shall not exceed 20 percent of the required landscaped area.

## 6. Retaining Walls

- a) Use of designed retaining walls shall be encouraged to reduce the slope and to provide planting pockets or terraces for revegetation and landscaping.
- b) Retaining walls may be permitted to support slopes but shall not exceed 10 feet in height in commercial areas or 6 feet in height in residential areas from the finished grade without stepping back a minimum of 3 feet between walls to create a terraced effect.
- c) No more than three tiers of retaining walls, as described above, shall be permitted to create terracing on a slope. Terraces created between retaining walls shall be permanently landscaped or revegetated and shall not exceed a 2:1 slope.
- d) Retaining walls shall be constructed of or faced with stone or earth-colored materials, or a material compatible with the primary building materials. Railroad ties, timber, and gabion-type retaining walls are prohibited. Retaining walls shall not exceed 50 feet in length without providing an offset at least 12 inches.
- e) All exposed retaining walls shall be textured or colored.



## 7. Detention/Retention Ponds/Debris Channels

- Detention/retention ponds and debris channels shall be visually integrated into the surrounding landscape.
- Embankment slopes shall not exceed a 2:1 ratio.

## 8. Plant Materials

- To meet the above standards, Plant Materials shall be chosen from the Plant List provided in the Appendix of this document. Xeric or low-water plant materials shall be utilized to the maximum extent feasible.

## 9. Landscape Requirements

- For the purposes of meeting the requirements in the table below, appropriate screening shall mean plant material, a low wall, or combination to provide an opaque barrier between the street and the adjoining use to be screened.

| Use                            | Residential Neighborhood                                                                                                         | Mixed-Use                                                                                                                        | Commercial                                                                                                                       | Hospitality                                                                                                                      | Mixed-Use Campus                                                                                                                 |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Required Open Space            | 40%                                                                                                                              | 15%                                                                                                                              | 15%                                                                                                                              | 30%                                                                                                                              | 30%                                                                                                                              |
| Open Space Planting            | <ul style="list-style-type: none"> <li>1 tree/1200 s.f.</li> <li>4 shrubs/1200 s.f.</li> </ul>                                   | <ul style="list-style-type: none"> <li>1 tree/500 s.f.</li> <li>4 shrubs/500 s.f.</li> </ul>                                     | <ul style="list-style-type: none"> <li>1 tree/1000 s.f.</li> <li>4 shrubs/1000 s.f.</li> </ul>                                   | <ul style="list-style-type: none"> <li>1 tree/1000 s.f.</li> <li>4 shrubs/1000 s.f.</li> </ul>                                   | <ul style="list-style-type: none"> <li>1 tree/1000 s.f.</li> <li>4 shrubs/1000 s.f.</li> </ul>                                   |
| Setbacks<br>Buffers<br>Screens | <ul style="list-style-type: none"> <li>1 tree/25 l.f.</li> <li>1/3 deciduous 2/3 evergreen</li> <li>10 shrubs/25 l.f.</li> </ul> | <ul style="list-style-type: none"> <li>1 tree/25 l.f.</li> <li>1/3 deciduous 2/3 evergreen</li> <li>10 shrubs/25 l.f.</li> </ul> | <ul style="list-style-type: none"> <li>1 tree/25 l.f.</li> <li>1/3 deciduous 2/3 evergreen</li> <li>10 shrubs/25 l.f.</li> </ul> | <ul style="list-style-type: none"> <li>1 tree/25 l.f.</li> <li>1/3 deciduous 2/3 evergreen</li> <li>10 shrubs/25 l.f.</li> </ul> | <ul style="list-style-type: none"> <li>1 tree/25 l.f.</li> <li>1/3 deciduous 2/3 evergreen</li> <li>10 shrubs/25 l.f.</li> </ul> |
| Midland Avenue ROW             | N/A                                                                                                                              | <ul style="list-style-type: none"> <li>1 tree/40 l.f.</li> <li>Irregular spacing</li> </ul>                                      | <ul style="list-style-type: none"> <li>1 tree/40 l.f.</li> <li>Irregular spacing</li> </ul>                                      | <ul style="list-style-type: none"> <li>1 tree/40 l.f.</li> <li>Irregular spacing</li> </ul>                                      | <ul style="list-style-type: none"> <li>1 tree/40 l.f.</li> <li>Irregular spacing</li> </ul>                                      |
| Wulfsen Road ROW               | <ul style="list-style-type: none"> <li>1 tree/35 l.f.</li> <li>Irregular spacing</li> </ul>                                      | <ul style="list-style-type: none"> <li>1 tree/35 l.f.</li> <li>Regular spacing</li> </ul>                                        | <ul style="list-style-type: none"> <li>1 tree/35 l.f.</li> <li>Irregular spacing</li> </ul>                                      | <ul style="list-style-type: none"> <li>1 tree/35 l.f.</li> <li>Irregular spacing</li> </ul>                                      | <ul style="list-style-type: none"> <li>1 tree/35 l.f.</li> <li>Irregular spacing</li> </ul>                                      |
| Internal Neighborhood Streets  | 1 deciduous tree/35 l.f. Evenly spaced                                                                                           | 1 deciduous tree/40 l.f. Evenly spaced                                                                                           | 1 deciduous tree/35 l.f.                                                                                                         | 1 deciduous tree/35 l.f.                                                                                                         | 1 deciduous tree/35 l.f.                                                                                                         |

Table 1—Landscape Requirements

# I. SERVICE AREA AND MECHANICAL/UTILITY EQUIPMENT SCREENING

## 1. Intent

The intent of these standards is to minimize the visual and noise impacts created by service areas and mechanical equipment on surrounding uses and neighborhoods from public rights-of-way, surrounding high elevation neighborhoods, and adjacent uses within Glenwood Meadows.

## 2. Service Areas

- No areas for outdoor storage, trash collection or compaction, loading, or other such uses shall be located within 20 feet of any public street, public sidewalk, or internal pedestrian

walkway.

- b) Loading docks, truck parking, outdoor storage, trash collection, trash compaction, and other service functions shall be incorporated into the overall design of the building and landscaping so that the visual and acoustic impacts of these functions are fully contained and out of view from adjacent properties and public streets.
- c) Screening materials shall be the same as, or of equal quality to, the materials used for the primary building and landscaping.

### **3. Mechanical/Utility Equipment**

- a) Mechanical/utility screening shall be an integral part of the building structure and architecture and not give the appearance of being "tacked on" to the exterior surfaces.
- b) All mechanical, electrical, and communications equipment, including but not limited to air-conditioning, heating and soft water tanks, television antennas, satellite dishes, security apparatus, transformers, electric and gas meters, shall be integrated into the building design, screened from public view, or when appropriate, enclosed in a suitable structure.
- c) Roof-mounted equipment shall be contained within a completely enclosed structure. Such structure shall be an integral part of the building's architectural design and shall use materials compatible with those used on the façade of the building. However, if it can be demonstrated that the roof mounted equipment shall be screened or shall be placed such that the equipment can not be viewed or silhouetted in profile from public vantage points and neighboring properties, this may be considered as an alternative by the City.
- d) Roof mounted equipment shall be clustered to the maximum extent feasible.
- e) Roof mounted equipment shall utilize neutral colors and/ or materials that are compatible with adjacent natural or constructed colors.
- f) A decorative wall constructed of materials compatible with the overall architectural design of the development and softened with landscaping shall screen ground-mounted equipment.

## **J. OPEN SPACE AND PARKS**

### **1. Intent**

The intent of these standards is to provide an interconnected network of open spaces and parks within non-residential and residential areas of Glenwood Meadows as well as to provide a high level of visual interest and a variety of recreational and leisure opportunities within a short walk of each residence in Glenwood Meadows.

### **2. General**

- a) Open spaces and parks within Glenwood Meadows shall include traditional, urban gathering spaces such as a village green, plaza, or town square in addition to a network of pathways and informal trails that help integrate the built environment of the neighborhood with adjacent open space and the natural environment. Appropriate locations for the above amenities shall be determined in part by the type of use they are integrated with.
- b) Existing trees and vegetation shall be preserved whenever possible to act as buffers between adjoining developments and as site amenities within the neighborhood.



### 3. Non-Residential

#### a) Outdoor Spaces

- (1) Pedestrian-oriented outdoor spaces shall be placed near activity generating uses, such as street corners, shops, stores, offices, day care, and dwellings.
- (2) To the maximum extent feasible, outdoor spaces shall be linked and visible from streets and sidewalks.
- (3) Sculpture, fountains, kiosks, or shelters shall be prominently placed in outdoor spaces.
- (4) In developments with multiple buildings, outdoor spaces and landscaped areas shall be integrated into an overall open space system in conjunction with streets and connections and not merely assembled from residual land remaining after buildings and parking lots have been sited.



#### b) Community Amenities

- (1) A minimum of 1,000 s.f. of community amenities, open areas, and public gathering places per 50,000 s.f. of Commercial building area or a percentage thereof. This shall be considered a component of the landscape requirements as referenced in Section H.9. Community amenities may consist of any of the following:
  - (a) Patio or plaza with seating area;
  - (b) Mini-parks, squares, or village greens;
  - (c) Water feature,
  - (d) Clock tower;
  - (e) Public art;
  - (f) Any other, similar deliberately shaped area and/or focal feature that, in the City's judgment, adequately enhances such community and serves as a gathering place.
- (2) All community amenities within a commercial development shall be an integral part of the overall design and within easy walking distance of major buildings, major tenants, and any transit stops.

### 4. Residential

#### a) Common Open Space

- (1) Common open space shall be organized to create integrated systems of open space that connect with the following types of lands located within or adjacent to the development:
  - (a) Dedicated public park or greenway lands;
  - (b) Other dedicated open spaces;
  - (c) Common open space located within or adjacent to the development;
  - (d) Portions of the trail and open space system;
  - (e) Neighborhood retail and commercial centers; and
  - (f) Adjacent employment centers.

Common open space with pedestrian access shall be reasonably accessible to all of the residents of the Glenwood Meadows:

- (2) Where provided, access to common open space shall be a minimum of six feet wide and shall be located where such access is visible to dwelling units and shall not be isolated by walls, screening, landscaping, or any other kind of barrier that would prevent resident surveillance of the open space.
- (3) If an applicant constructs recreational facilities in the common open space as a community amenity, such recreational facilities shall be constructed in accordance with applicable city standards regarding, but not limited to, size, siting, use, materials, and similar matters.
- (4) Where common open space is bordered by private rear or side yards, opaque fences and walls shall not be erected in such yards bordering the open space. Open style fences, with a maximum 50% opacity (e.g., post and rail), shall be allowed on the perimeter of open space.

b) Parks

- (1) One neighborhood park shall be provided within each residentially zoned parcel or "neighborhood". Each park shall be at least 1 acre in size.
- (2) Each neighborhood park shall be located where the network of local streets provides access and where direct pedestrian and bicycle access are provided from adjacent uses.
- (3) Neighborhood parks shall be located in a visible, secure setting that is easily observed from streets. Rear facades of multi-family dwellings that do not contain building entrances shall not abut more than two sides of the park's perimeter.
- (4) Each neighborhood park shall contain one or more of the following features:
  - (a) Multi-use areas;
  - (b) Community gardens;
  - (c) Walking paths;
  - (d) Plazas;
  - (e) Pavilions;
  - (f) Picnic tables;
  - (g) Benches; or
  - (h) Other similar features for various age groups to enjoy.

## K. SIGNAGE

### 1. Intent

The intent of these standards is to provide consistent, high quality signage for Glenwood Meadows. All signage must be reviewed and approved by the Architectural Review Committee prior to permit application and must conform to all City of Glenwood Springs standards.

### 2. General

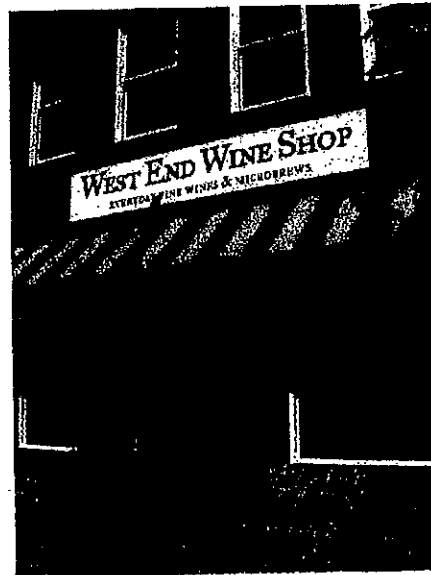
- a) Each building group, user, or tenant shall be allowed at least one sign on the primary storefront elevation, providing such signage meets these standards and does not exceed the ordinance and requirements of the City of Glenwood Springs.
- b) Signage placed at locations other than site locations and/or storefront elevation (such as rear and side wall locations) shall be considered provided that the total square footage allowance of all signage does not exceed the total aggregate area allowed by requirements of the City of Glenwood Springs Code.
- c) All attachment devices, wiring, clips, transformers, lamps, tubes, and other mechanisms for signs shall be concealed.
- d) Permanent signage may be illuminated providing it is designed so the source is not visible.

Individual internally lit channel letter signs or accent lighting, which is incorporated to enhance the signage, is acceptable. All signage lighting shall conform to lighting standards provided by the City of Glenwood Springs.

- e) Each tenant shall provide signage at its expense and shall apply for and obtain their individual signage permits and approvals from the City of Glenwood Springs.

### 3. Freestanding Signs

- a) No individual sign shall exceed 200 square feet in area nor shall the total sign area of any tenant exceed 600 square feet.
- b) The placement of all signs shall be based on visibility and legibility. All freestanding identification signs shall be integrated into the surrounding landscape with good visibility to approaching vehicular traffic.
- c) All freestanding signs shall be set back a minimum of 10 feet from the edge of curb and/or property line and six feet from all sidewalks.
- d) Freestanding signs shall not be placed within the site triangle of an intersection as defined in the City of Glenwood Springs Code.
- e) The information contained on freestanding identification signs shall be limited to company and corporate logos, and may include building names and addresses.



### 4. Regulatory Signs

- a) The basic design and mounting heights of regulatory signs shall follow Federal Highway Administration standards.

### 5. Building Mounted Signage

- a) Building mounted signage shall be allowed only for commercial developments for the specific purpose to provide identification to the tenant.
- b) Signage style shall be as approved by the Architectural Review Committee.

### 6. Colors and Materials

- a) The Architectural Review Committee shall consider all colors for approval.

### 7. Informational/Directional

- a) Informational/directional signs shall be designed to conform to the proportions shown in these guidelines and shall not have a sign face which exceeds 20 square feet.
- b) The number of informational/directional signs may vary by site, but shall be sufficient to accommodate both vehicular and pedestrian traffic.
- c) Informational/directional signs for motorists shall be located between 100 and 200 feet from intersections.
- d) Signs for pedestrians shall be placed at decision points in parking lots, in plazas, and where highly traveled walkways intersect.

## **L LIGHTING**

### **1. Intent**

The intent of these standards is to ensure that building, site, street, and signage lighting is sensitive to adjoining uses and is compatible with the overall development character in terms of scale and design.

### **2. General**

- a) All development shall be in compliance with the City of Glenwood Spring's Lighting Standards or comparable document as provided by the City.

## VI. Development Standards: Parcel "A", Mixed-Use Campus (C-1)



### A. GENERAL INTENT

The intent of these standards, when combined with the General Development Standards, is to provide a framework for the development of a quality office and business park for Glenwood Springs. The Campus is envisioned to accommodate a variety of office, research and development activities in addition to complementary secondary uses such as restaurants, convenience shopping, childcare and housing. Additionally, the Campus is intended to function as an integral part of the overall Glenwood Meadows development, providing a range of employment opportunities for nearby residents.

### B. APPLICABILITY

These standards shall apply to all development within Parcel "A", Mixed-Use Campus as defined on the accompanying Zoning Map. These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.

### C. SITE LAYOUT AND DEVELOPMENT PATTERN

#### 1. Intent

The intent of these standards is to encourage the creation of a park-like campus environment within the mixed-use campus zone and to ensure that non-residential uses within the mixed-use campus environment provide appropriate height and scale transitions to adjacent or adjoining residential uses.

#### 2. General

- a) All uses shall be carried out within completely enclosed buildings or structures, except for off-street parking and loading areas.



**3. Landscaping**

- a) All open space areas shall be landscaped according to Table 1-Landscape Requirements.

**D. BUILDING DESIGN**

**1. Intent**

The intent of these standards is to create a cohesive, office park environment through the use of common materials, architectural features, and colors.

**2. General**

- a) See Section V. General Development Standards.

**3. Orientation**

- a) Buildings shall be oriented towards the adjacent street or towards the center of a campus or park-like development block with an internal framework of outdoor spaces or connecting walkway.

**4. Transition**

- a) Buildings abutting a residential area shall provide a gradual transition in height and scale to minimize conflicts between uses.

**E. MIX OF USES**

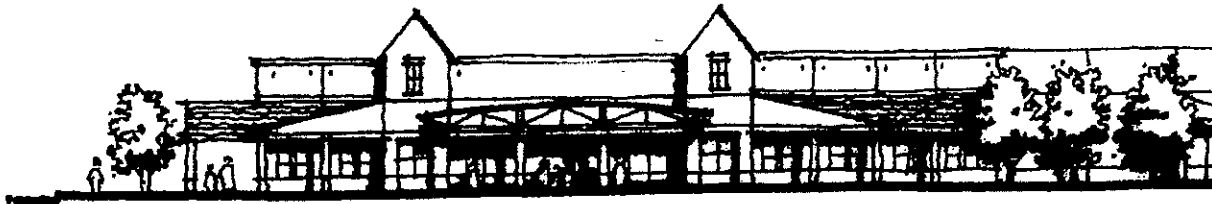
**1. Intent**

The intent of these standards is to provide general standards for appropriate percentages and locations of supporting uses within the mixed-use campus environment. Secondary uses are envisioned to include restaurants, convenience shopping, childcare, housing, or similar uses to complement primary office and research and development activities.

**2. General**

- a) All supporting uses shall be visually and functionally integrated into an overall plan that emphasizes the primary uses of office and employment uses.
- b) Retail uses shall not occupy more than 25 percent of the total gross area of the zone district.

## VII. Development Standards: Parcels "C", "D", and "H"-Commercial (C-2)



### A. GENERAL INTENT

The intent of these standards is to achieve a high quality, pedestrian-friendly commercial core within Glenwood Meadows. This core will be anchored by large format retail anchors such as a grocery store and/or discount store and will be supplemented with a variety of smaller retail businesses. The purpose of this zone district is to serve both the needs of regional consumers for goods and services and the day-to-day needs of the surrounding residential neighborhoods in a functional and inviting environment that strays from the typical auto-oriented designs found in many commercial centers. The district is intended to function as an integrated center of activity within the overall Glenwood Meadows development through the establishment of clear pedestrian and vehicular circulation patterns and through transitions in the scale and character of development where they abut adjacent uses.

### B. APPLICABILITY

These standards shall apply to all development within Parcels "C", "D", and "H", Commercial as defined on the accompanying Zoning Map. *These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.*

### C. SITE LAYOUT AND DEVELOPMENT PATTERN

#### 1. Intent

The intent of these standards is to ensure that primary and secondary retail uses utilize careful building placement and orientation to create and enhance an active, attractive, pedestrian environment within the commercial core of Glenwood Meadows. Primary Commercial Buildings will serve as "anchors" for the commercial and mixed-use zones. These larger uses will be flanked by a variety of supporting, pedestrian-oriented retail storefronts and secondary commercial uses located on pad sites. The siting and design of smaller retail stores, or "pads," can create a more inviting appearance along Midland Ave and with in the neighborhood by visibly reducing the project's scale and by expanding the range of activities and businesses found within the neighborhood. The location, orientation of the entry, and architecture of pad site buildings also provide opportunities to frame the entry into the neighborhood and contribute to the development's visual interest by placing storefront spaces closer to the street and creating a street scene. Accordingly, pad site structures shall be compatible with the main buildings on a commercial site. The layout of pad site buildings shall relate coherently to the public streets and surroundings (outward) as well as to the main center (inward), and specific siting decisions shall further the general intent of creating a "sense of place," focal points,

community amenities, and arrival into the commercial center.

## 2. General

- a) See Section V. General Development Standards.
- b) Pad Sites The primary façade of a building located on a pad site, typically the façade containing the primary customer entrance, may be oriented in a variety of ways, including:
  - (1) Toward the primary access street;
  - (2) Toward an internal "main street";
  - (3) Framing a primary entrance to the development or center;
  - (4) Toward the side (especially when that side faces another pad site building); or
  - (5) Toward the interior of the center.
- c) Regardless of primary orientation, all sides of a pad site building that directly face and have access to a public street shall contain a customer entrance.
- d) Pad sites shall be clustered together to define street edges and entry points or to enclose and create community amenities and visual interest between buildings.
- e) Wherever practicable, spaces between adjacent pad site buildings shall be improved to provide small pockets (preferably heavily landscaped) of customer parking, pedestrian connections, small-scale project amenities, or focal points. Examples include, without limitation:
  - (1) A landscaped pedestrian way linking customer entrances between two or more pad site buildings;
  - (2) A public seating or outdoor eating area;
  - (3) An area landscaped with living materials emphasizing 4-season colors, textures, and varieties; or
  - (4) Sculptures or fountains.

## D. BUILDING DESIGN

### 1. Intent

The intent of these standards is to ensure that the design of buildings located in parcels "C", "D", and "H", present a cohesive appearance through the use of common materials, architectural features, and colors.

### 2. General

- a) See Section V. General Development Standards.
- b) Pad site buildings and other accessory uses shall incorporate a similar façade and building design as those on the primary commercial building(s) in the zone district, including:



- (1) Exterior building materials;
  - (2) Roofline or roof materials;
  - (3) Façade colors;
  - (4) Pedestrian entry locations and entryway architecture/design;
  - (5) Amounts of glazing on facades visible from public streets; and
  - (6) Other distinctive architectural features.
- c) Pad site buildings and other accessory uses shall select their exterior building materials from the material palette used on the primary commercial building(s).

### 3. Large Format Commercial

- a) Large format commercial buildings of 60,000 square feet or greater shall have a minimum of one side of the building "wrapped" with independent retail storefronts. Uses adjoining Market Street shall "wrap" the edge closest to the street to help establish a pedestrian-oriented environment and create a transition to the mixed-use zone along Market Street, as discussed in Section VIII.

## VIII. Development Standards: Parcel "E", "F", "G"-Mixed-Use (C-2)

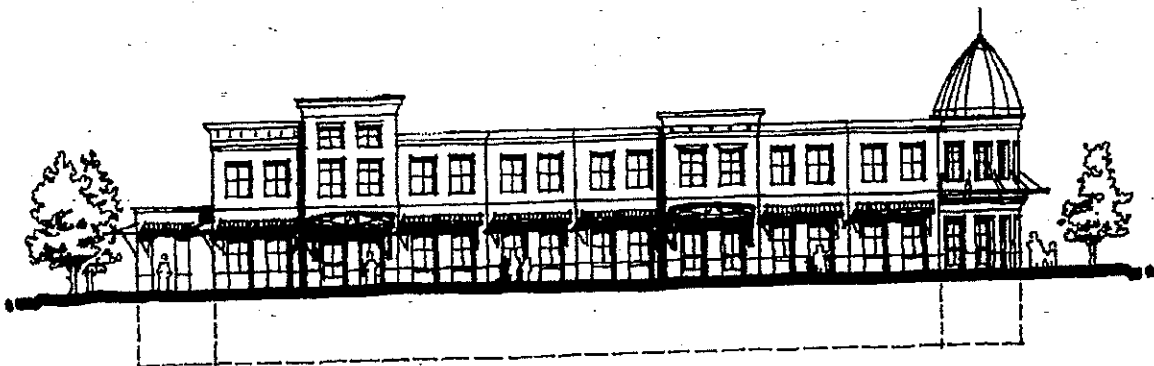
### A. GENERAL INTENT

The intent of these standards is to create the framework for a pedestrian-oriented neighborhood retail street that will serve as the focal point for Glenwood Meadows. Oriented along a key connection between Midland Avenue and Wulfsohn Road, Market Street will be defined by a variety of smaller-scale retail shops and restaurants and will be designed with the pedestrian in mind. Storefronts will frame the broad sidewalk, while outdoor seating, landscaping, fountains, and other amenities will combine to create an inviting destination for nearby residents and retail customers alike. Diagonal parking will line either edge of the street, further enhancing the comfortable, pedestrian-oriented feeling by creating a buffer between outdoor activity and through traffic.



Market Street

Along the north side of Wulfsohn Road, bi-level structures will be used to help accommodate a transition in grade between larger commercial uses below and uses at grade with Wulfsohn Road. A variety of retail, offices and flex spaces, and upper-story residential will complement uses along Market Street and on the south side of Wulfsohn Road. Upper stories also help screen views from residential neighborhoods stepping up the hillside over large format uses below. Lower level uses will be oriented towards adjacent commercial and retail while primary uses located on the upper level along Wulfsohn Road will be oriented towards the street and the adjoining neighborhood. Buildings will be pulled up to the sidewalk to create a defined edge along the broad sidewalk. Off-street parking will be focused behind buildings to the extent feasible to enhance the pedestrian nature of the street and diagonal or parallel parking will be provided along Wulfsohn Road. Wulfsohn Road shall be designed to accommodate on-street bicycle circulation.



Wulfsohn Road



On the south side of Wulfsohn Road, the zone takes on a more neighborhood-oriented character; with small-scale first floor retail uses lining the street and the opportunity for upper-story residences. The addition of residential uses within the zone would provide a transition between commercial uses to the north and residential neighborhoods to the south and provide attainable options within an already varied mix of housing products. This also provides opportunities for live/work units if desired and creates more of an active street environment. The pedestrian nature of the street along Wulfsohn Road provides opportunities for pedestrian-oriented uses such as sidewalk cafes.

## B. APPLICABILITY

These standards shall apply to all development within Parcels "E", "F", and "G", Mixed-Use as defined on the accompanying Zoning Map. These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.

## C. SITE LAYOUT AND DEVELOPMENT PATTERN

### 1. Intent

The intent of these standards is to ensure that building placement, setbacks, and orientation support the creation of a pedestrian scaled neighborhood retail street to serve as the retail core of the larger commercial development and Glenwood Meadows as a whole.

### 2. General

- a) Compatible uses (i.e., office building and a movie theatre) shall explore opportunities for shared-use parking to minimize overall space requirements for parking.

### 3. Mix of Uses

- a) Each pod of development within the zone shall contain at least 2 of the following uses:
  - (1) Residential;
  - (2) Retail; or
  - (3) Office.
- b) A minimum of 20 residential units shall be provided within the E, F and G mixed use parcels.

### 4. Location of Parking along Market Street and Wulfsohn Road

- a) Parking shall be angled or parallel on-street parking.
- b) Off-street parking shall not be permitted between buildings and either Market or Wulfsohn.



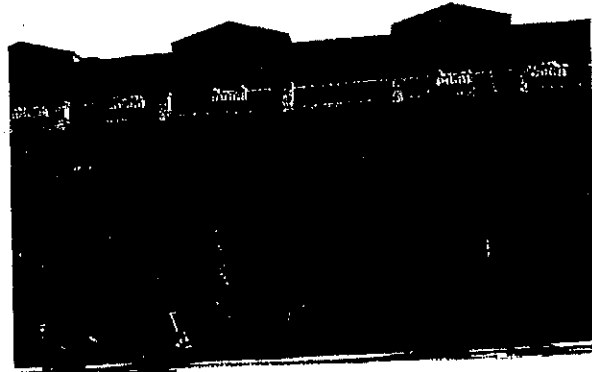
### 5. Building Setback from Market Street and Wulfsohn Road

- a) There shall be no minimum front, rear, and side yard setbacks required to promote a more urban, pedestrian-oriented environment along the street, provided local building code requirements are met.
- b) Should retail be constructed in phases, the front setback of later structures shall be built to equal the average setback of those structures already in place.
- c) Buildings at the corners of Market Street and Wulfsohn Road shall be anchored, or brought up to meet the sidewalk edge and shall utilize a similar scale and massing as other buildings along the street edge.



### 6. Building Orientation

- a) All buildings and building entries shall be oriented towards the primary street.
- b) New buildings shall be aligned with existing buildings located across the intersecting streets to "complete" the space around the corner and create visual continuity.



### 7. Sidewalk Width

- a) Sidewalk widths shall be a minimum of 10 feet along Market Street and Wulfsohn Road in order to provide ample space for outdoor seating and smooth pedestrian movement.

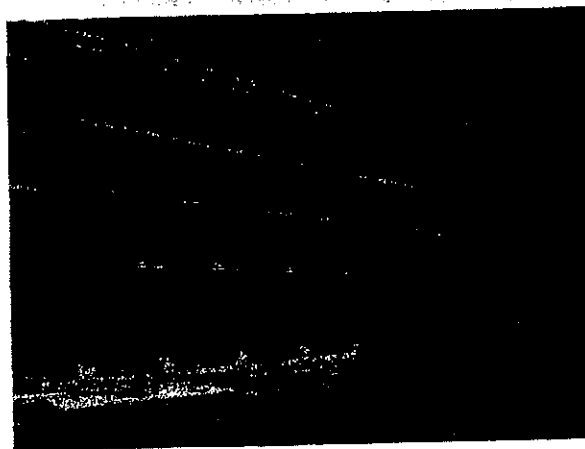
## D. BUILDING DESIGN

### 1. Intent

The intent of these standards is to create a pedestrian-oriented feeling for the facades of retail establishments along Market Street and along Wulfsohn Road.

### 2. General

- a) See Section V. General Development Standards.



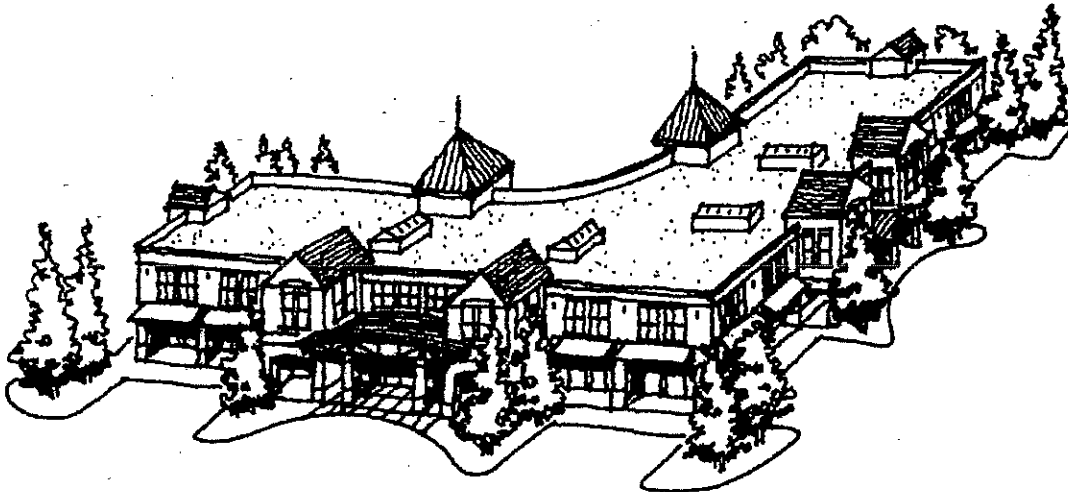
### 3. Building Height

- a) Buildings shall be a minimum of 2 stories in height along the street edge. However, in order to create an active street environment along Market Street, especially at the intersection of Market St. and Midland Ave., portions of building or key buildings may be less than 2 stories if it can be demonstrated that the establishments add to the vitality of the street environment.
- b) Along the north edge of Wulfsohn Road, buildings may need to be 3 stories in height to accommodate changes in grade and meet the above requirement.

### 4. Façade Articulation

- a) One or more of the following design elements shall be incorporated for each 25 horizontal feet of a building façade or wall:
  - (1) Changes in color, texture, or materials;
  - (2) Projections, recesses, and reveals, expressing structural bays, entrances, or other aspects of the architecture with a minimum change of plane of 4-6 inches;
  - (3) Arcades or pergolas providing pedestrian interest.
- b) Retail storefronts shall consist of predominantly transparent display windows on the first floor sidewalk edge.
- c) Darkly tinted glass or other opaque materials shall not be used in display windows.
- d) Traditionally, windows in multi-story commercial buildings have a width to height ratio of one to two. Second story or upper story windows should generally be smaller than the storefront windows at ground level and shall be evenly spaced across all facades adjacent to the street.

## IX. Development Standards: Parcel "I", Hospitality (C-4)



### A. GENERAL INTENT

The general intent of these standards is to create a full service hospitality site within Glenwood Meadows that accommodates a hotel with conference space or meeting rooms, a multi-screen movie theatre or other entertainment venue, such as a performing arts facility or outdoor amphitheater, visitor center, and/or a limited assortment of supporting retail uses such as restaurants or small stores, outdoor recreational opportunities, and the potential integration of a future park and ride and transit stop. The hospitality site is intended to function as more of a "campus" type environment, with more flexibility regarding the placement and relationship of uses as compared to the site's adjacent commercial areas based on the "campus" concept, meeting rooms or a separate dedicated facility on the site could serve as an extended learning facility or a business education and training facility. In addition to the adjacent commercial uses, all uses found on this site are also intended to complement the adjacent Community Center.

### B. APPLICABILITY

These standards shall apply to all development within Parcel "I", Hospitality as defined on the accompanying Zoning Map. These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.

### C. SITE LAYOUT AND DEVELOPMENT PATTERN

#### 1. Intent

The intent of these standards are to ensure that the design of hospitality uses are compatible in terms of scale and mass with adjacent residential and commercial development and with the

Community Center.

**2. General**

- a) Compatible uses (i.e., office building and a movie theatre) shall explore opportunities for shared-use parking to minimize overall space requirements for parking.

**3. Setbacks**

- a) Minimum front yard setbacks shall be as follows:
  - (1) From Midland Avenue and Wulfsohn Road: 25 ft.
  - (2) From uses in adjacent commercial parcel: 20 ft.
- b) There shall be no minimum side or rear yard setback to promote a more urban, pedestrian-oriented environment within the Hospitality zone district.
- c) At the time of the development permit application, a build to line shall be established to create a strong relationship to Wulfsohn Road, the Community Center, and adjacent mixed-use structures. The location of this line may vary depending on the site layout concept.

**4. Landscaping**

- a) All open space areas shall be landscaped according to Table 1-Landscape Requirements.

**5. Mix of Uses**

- a) Retail uses shall be limited to 25% of the total square footage permitted within the zone district. For the purposes of this standard, a theater shall not be defined as a retail use.

**6. Relationship to Community Center**

- a) All uses with frontage along Wulfsohn Road shall provide an entrance along that frontage.

**7. Parking**

- a) Large areas of parking shall be distributed between at least two sides of the primary structure, with not more than 35% of the parking for the entire Hospitality parcel remaining between the principal building and Wulfsohn Road.

**D. BUILDING DESIGN**

**1. Intent**

The intent of these standards are to ensure that the design of full service hospitality uses are compatible in terms of scale and mass with adjacent residential and commercial development and with the Community Center.

**2. General**

- a) See Section V. General Development Standards.
- b) When public or semi-public spaces such as the hotel/motel lobby, restaurants, meeting rooms, and banquet-facilities are sited at ground level adjacent to a connecting pedestrian walkway, these spaces shall be accented with the use of glass and transparent materials between the height of 3 feet and 8 feet above the walkway or street grade.

**3. Building Height**

- a) The maximum height of buildings shall not exceed 45 feet.
- b) A variety of heights within the zone are encouraged. In addition, the use of height to create a focal point or prominent structure within the zone is also encouraged.



## **X. Development Standards: Parcels "B", "F", and "G", Residential Neighborhoods (R-3)**

### **A. GENERAL INTENT**

The intent of these standards is to establish general criteria for the development of a series of compact residential neighborhoods that provide a range of housing types within a short walk of community amenities, such as parks and open space, retail and commercial services, and employment.

### **B. APPLICABILITY**

These standards shall apply to all development within Parcels "B", "F", and "G", Residential Neighborhoods as defined on the accompanying Zoning Map. *These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.*

### **C. SITE LAYOUT AND DEVELOPMENT PATTERN**

#### **1. Intent**

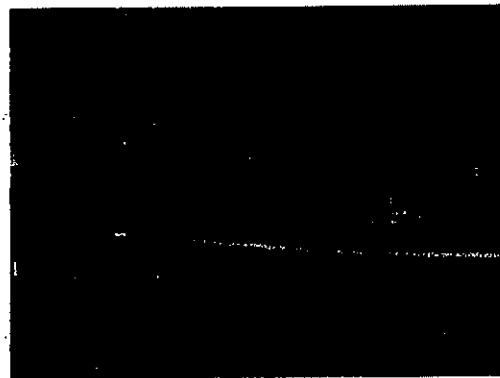
The intent of these standards is to ensure that residential neighborhoods within Glenwood Meadows provide a variety of housing types in a cohesive, pedestrian-oriented environment and provide appropriate transitions to adjacent non-residential uses and open space, and work with the more pronounced topographical features of the site.

#### **2. Mix of Housing Types**

- a) A range of housing types is strongly encouraged to promote a diverse community of mixed ages, family-types and incomes. Out of the 475 approved residential units, a maximum of 300 apartments shall be provided.

#### **3. Block Layout**

- a) Residential neighborhoods shall be designed in a pattern of blocks and interconnecting streets and/ or alleys, defined by buildings, streetscape, sidewalks, and trails.
- b) The maximum block length for a block shall be 500 feet. Where mid-block pedestrian walkways are provided, blocks may be up to 800 feet.



#### **4. Lot Sizes**

- a) Lot sizes shall be a minimum of 3000 square feet where permitted by Glenwood Springs Municipal Code.

#### **5. Setbacks**

- a) Homes shall be setback a minimum of 20 feet from the front property line.

## 6. Site Grading

- a) The use of extensive grading or unusual site improvements to force a preconceived design onto a particular piece of property is strongly discouraged. Modifying the design of a multifamily development to fit the site generally results in a reduced potential for environmental problems and an improved level of visual interest and variety.
- b) To the maximum extent feasible, the layout of residential developments shall follow and respect the natural topography of the site.
- c) Berms, channels, swales, and similar man-made changes to the landscape shall be designed and graded to be an integral part of the natural landscape and to provide a smooth transition in changes of slope.

## 7. Site Layout

- a) Each of the three residential parcels within the Glenwood Meadows shall be considered an individual "neighborhood". A mix of housing types is encouraged within each neighborhood.
- b) Multifamily buildings shall be separated by common open space, public open space (e.g., a greenway), natural features located on the site (e.g., a stream corridor), or community amenities such as swimming pools or other recreational facilities.



- c) To the maximum extent practicable, multi-family buildings shall be oriented or arranged in a manner to enclose common open spaces required above (Common Open Space). Such common open spaces should include gardens, courtyards, recreation, or play areas and shall contain at least 3 of the following features:



- (1) Seasonal planting areas;
- (2) Large, flowering trees;
- (3) Seating;
- (4) Pedestrian-scaled lighting;
- (5) Gazebos or other decorative shelters;
- (6) Play structures for children; or
- (7) Natural features or areas.

## 8. Development Transition

- a) When any portion of a building or structure within a multifamily development is located adjacent to property used or zoned for lower-density residential, the following standards shall apply to ensure the privacy of nearby residents:
  - (1) The developer shall site multifamily structures with either fewer units or structures with two-story "end" units adjacent to property zoned or used for single-family residential.
- b) Accessory structures, including garages and recreational facilities, shall be set back at least

5 feet from the adjacent residential property line or zoning district boundary, and the developer shall provide a buffer between the structure and adjacent property. The buffer may be a fence, wall, heavy landscaping, or combination thereof. Fences and walls used for buffer purposes shall be a maximum of 6 feet in height, with finished side facing out.

- c) Residential neighborhoods adjacent to open space shall incorporate one or more of the following techniques to create a visual transition between development and surrounding open space:
  - (1) Staggering building setbacks to create a softer development edge.
  - (2) Establishing a landscape buffer along the rear or visible edge(s) of the property to create a soft visual edge to the development.
  - (3) Locating structures near or behind existing stands of significant trees or vegetation so that the cluster of vegetation provides a buffer between the development and the adjoining open space. When siting structures in such a manner, care should be taken to not disturb existing vegetation either during or following construction.
  - (4) Utilizing a variety of native plant species and planting forms similar to those found on the adjoining open space, to create the appearance of a natural transition in the landscape.

## 9. Community Amenities

- a) All residential projects with more than 10 dwelling units shall reserve and develop internal open space/outdoor leisure space, at a minimum ratio of 200 s.f. per unit. These open spaces/outdoor leisure areas shall be improved with a variety of community amenities, including, but not limited to the following:
  - (1) Community Garden;
  - (2) Grove of trees;
  - (3) Village green;
  - (4) Pocket park;
  - (5) Swimming pool;
  - (6) Resident clubhouse;
  - (7) Tot lots;
  - (8) Basketball, volleyball, or other sport court; or
  - (9) Picnic areas.
- b) To the maximum extent feasible, internal open spaces/outdoor leisure spaces as required above shall be consolidated to create larger common spaces for residents.

## 10. Fencing

- a) Perimeter fencing shall be of an open style, such as 2, 3, or 4 rail, split rail, wood post, or other similar style characteristic of the area's rural heritage.
- b) Consistent styles of fencing shall be used throughout the neighborhood in order to achieve a cohesive appearance.

## 11. Storage of Personal Property

- a) Dedicated storage for Recreational Vehicles (RV's), snowmobiles, trailers, and other personal property, not including personal automobiles, shall be provided off-street. Such property shall not be stored within the public right-of-way.
- b) Storage areas, as outlined above, shall be screened to minimize visibility from adjacent streets and property lines as follows:

- (1) One continuous row of evergreen trees (minimum of 6 feet tall) shall be planted with a minimum spacing of 10 feet on center; or
- (2) One continuous row of evergreen shrubs (minimum of 5 gallon in size) planted at a minimum spacing of 3 feet on center, and deciduous trees planted at an average of one tree every 15 linear feet.

## **D. PARKING**

### **1. Intent**

The intent of these standards is to ensure that garages and parking areas within Glenwood Meadow's residential neighborhoods are appropriately scaled and sited to minimize their visual impact upon the street.

### **2. Location and Layout**

- a) To the maximum extent feasible within slope constraints, garage entries, carports, parking areas, and parking structures shall be internalized in building groupings or oriented away from street frontage.
- b) Parking areas and freestanding parking structures (detached garages or carports) shall not occupy more than 50% of each perimeter street frontage.
- c) To the maximum extent practicable, freestanding parking structures (detached garages or carports) that are visible from perimeter public streets shall be sited perpendicular to the perimeter street in order to reduce visual impacts on the streetscape.
- d) Carports shall be limited to 72 feet in length, with a maximum of 8 parking spaces per carport structure.
- e) If a carport backs to the street, a landscape buffer shall be provided according to the requirements contained in Table 1-Landscape Requirements., within Section V.
- f) A detached garage structure shall contain parking for no more than 8 cars.
- g) No more than 2 detached garage structures or 2 carport structures shall be located adjacent to each other end to end.
- h) The minimum separation between adjacent detached parking structures (detached garages or carports) shall be 10 feet, and such separation area shall be landscaped with at least 1 deciduous tree and ground cover or sod. A pedestrian access way may be included within the separation area.



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## E. BUILDING DESIGN



### 1. Intent

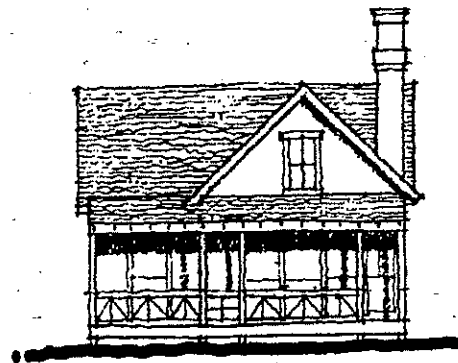
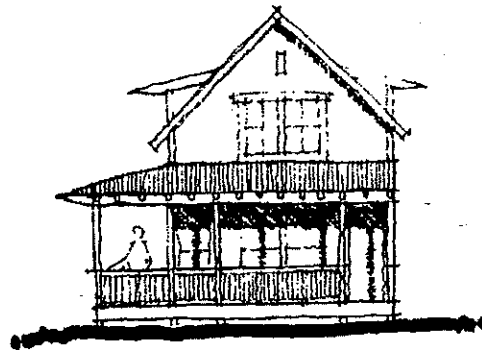
These standards are intended to encourage a variety of residential building character within Glenwood Meadow's neighborhoods by encouraging the use of identifiable design features and detailing to emphasize the façade at the street and create visual interest.

### 2. General

- a) See Section V. General Development Standards.

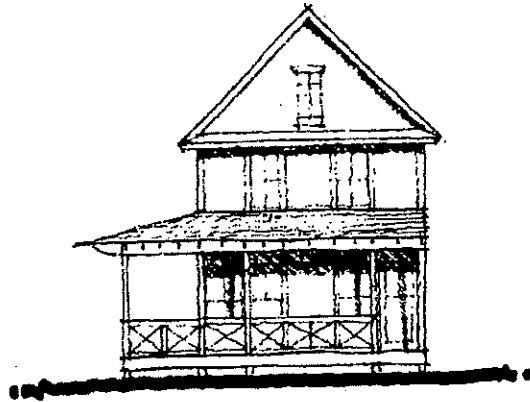
### 3. Architectural Detail

- a) The incorporation of porches, balconies, and patios shall be strongly encouraged for all residential types.
- b) Building entries shall be called out as a prominent streetscape feature for all residential types by extending the front of the main façade and emphasizing with materials and detailing.
- c) Garages shall not be the prominent streetscape element. They shall be recessed and/or oriented towards the side or rear of the lot.

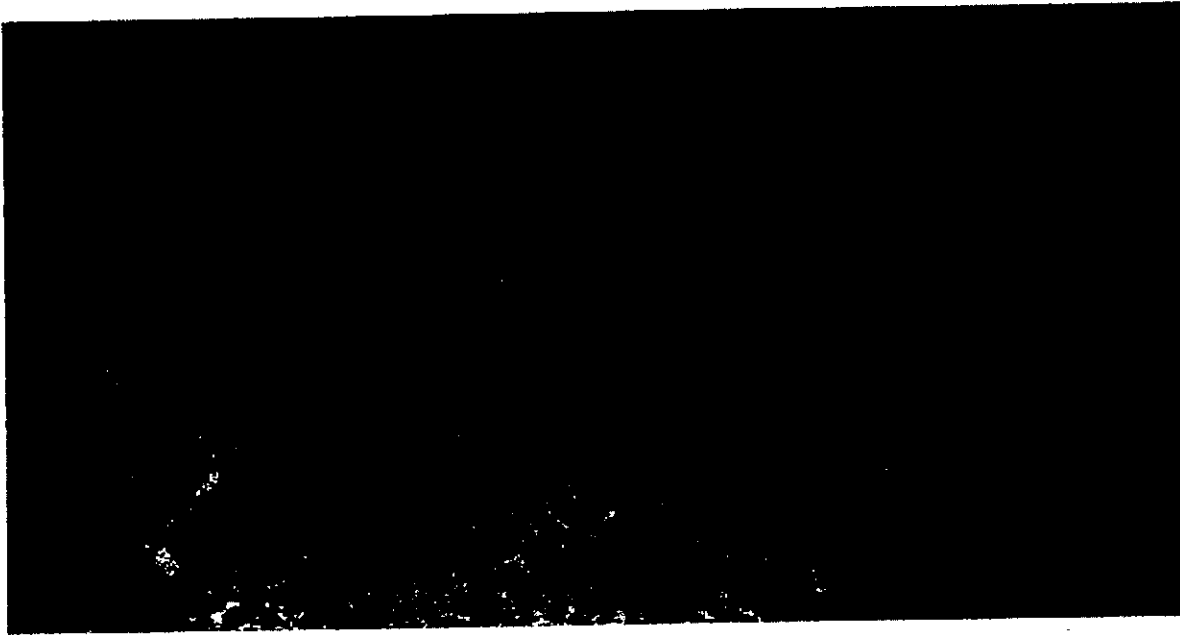




- d) The facades of single-family attached town homes shall be articulated to differentiate individual units.
- e) All sides of a multi-family building shall display a similar level of quality and architectural interest. The majority of a building's architectural features and treatments shall not be restricted to a single façade.
- f) Fronts of buildings shall be articulated through the use of bays, insets, balconies, porches, or stoops related to entrances and windows.
- g) No more than 5 town home dwelling units shall be attached in any single row.



## **XI. Parcel L: Open Space and Parks (HP)**



### **A. GENERAL INTENT**

The intent of these standards is to provide guidance for the range of appropriate uses that could occur within this portion of the Glenwood Meadow's site. The site is characterized by its dramatic views of Red Mountain, which frames the site on the south side, by its varied and sometimes dramatic topography, and by its lush stand of Gambel oaks. The site encompasses over 62% of the total area of Glenwood Meadows presents an opportunity to establish public open space for the neighborhood and for the larger Glenwood Spring's community that accommodates year-round active and passive recreational uses.

Many of the sites potential uses will vary from season to season, providing a range of activities for the community. For example, the north aspect of Red Mountain's slopes retain snow cover, creating a haven in its shadows for winter sports such as snow shoeing or cross-country skiing, while lower slopes with more solar exposure provide more opportunities for year-round activities such as hiking, biking, and possibly a golf course.

### **B. APPLICABILITY**

These standards shall apply to all development within Parcels "L", Open Space and Parks as defined on the accompanying Zoning Map. These standards shall be applied in addition to standards outlined in Section V., General Development Standards and in the City of Glenwood Springs Municipal Code.

### **C. ACTIVE RECREATION**

#### **1. Intent**

The intent of these standards is to suggest a range of appropriate active recreational uses for particular areas of the site, based on its varying landscape characteristics, such as slope,

vegetative cover, and proximity to the residential neighborhoods of Glenwood Meadows. As a general rule, more land intensive, active uses, such as a golf course or a community park shall be located adjacent to or be partially integrated with nearby residential neighborhoods. By locating active uses near developed areas, where slopes are typically between 10 and 20 percent, pedestrian access to the sites would be more easily facilitated and a wider range of uses could be accommodated. Steeper slopes located towards the base of Red Mountain can be utilized to accommodate multi-use trails with little disturbance to existing landforms or views of the site. All development on the site, regardless of its intensity or location, shall work with existing site features to minimize overall disturbance and visual impacts.

## 2. General

- a) Appropriate uses shall include, but not be limited to the following:
  - (1) Hiking trails;
  - (2) Golf courses;
  - (3) Mountain bike trails;
  - (4) Cross-country skiing trails;
  - (5) Equestrian trails;
  - (6) Snow shoeing trails; or
  - (7) Neighborhood parks.
- b) Any of the above uses, as well as any additional non-prohibited uses as identified in the Appendix-Prohibited Uses for Parcel L, shall be required to undergo a special use review prior to approval. Soft surfaced trails and debris flow mitigation structures shall be allowed uses, the design and location of which shall be approved by City staff.
- c) The use of motorized recreational vehicles such as snowmobiles, motorcycles, or similar vehicles shall not be permitted.
- d) All uses shall use all practical means of preserving natural grade, drainage patterns, soil cover, and vegetation.
- e) All uses shall be designed to minimize visual disturbances and scarring to the site, as viewed from within the site, from surrounding developments, and from Interstate-70.
- f) All uses shall preserve and integrate outstanding natural physical features such as hill and ridge crests, natural rock outcroppings, major tree belts, watercourses, and other physical features.
- g) Public access points shall be provided from residential neighborhoods to adjoining open space. To the maximum extent feasible, access points shall be provided a minimum of every 500 feet.

## **XII. Appendix**

### **A. PLANT LIST**

#### **1. Large Deciduous Trees**

- a) Narrow leaf Cottonwood-*Populus angustifolia*
- b) Cottonwood 'Siouxland'-*Populus deltoides* 'Siouxland'
- c) Lanceleaf Cottonwood-*Populus x acuminata*
- d) Norway Maple-*Acer plantanoides*
- e) Red Maple-*Acer rubrum*
- f) Northern Catalpa-*Catalpa speciosa*
- g) Common Hackberry-*Celtis occidentalis* (spring planting)
- h) American Ash-*Fraxinus americana* 'Autumn Purple'
- i) Green Ash-*Fraxinus pennsylvanica*
- j) Thornless Honeylocust 'Shademaster'-*Gleditsia triacanthos inermis*
- k) Bur Oak- *Quercus macrocarpa*
- l) English Oak-*Quercus robur*
- m) American Linden-*Tilia americana*
- n) Littleleaf Linden-*Tilia cordata* 'Greenspire'
- o) Redmond Linden-*Tilia x euchlora* 'Redmond'
- p) American Elm-*Ulmus Americana*

#### **2. Ornamental Trees**

- a) Amur Maple-*Acer ginnala*
- b) Thinleaf Alder-*Alnus tenuifolia*
- c) Shadblow Serviceberry-*Amelanchier canadensis*
- d) Rocky Mountain or water birch-*Betula occidentalis*
- e) Cockspur Hawthorn-*Crataegus crus-galli*
- f) Washington Hawthorn-*Crataegus phaenophyrum*
- g) Quaking Aspen-*populus tremuloides*
- h) Newport Plum-*Prunus cerasifera* 'Newport'
- i) Canadian Red Cherry-*Prunus virginiana* 'Shubert'
- j) Callery Pear-*Pyrus calleryana*
- k) Gambel Oak-*Quercus gambelii*

#### **3. Evergreen Trees**

- a) Subalpine or Rocky Mountain Fir-*Abies lasiocarpa*



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- b) Douglas Fir-Pseudotsuga menziesii glauca
- c) Rocky Mountain Juniper-Juniperus scopulorum
- d) Bristlecone Pine-Pinus aristata
- e) Lodgepole Pine-Pinus contorta latifolia
- f) Pinyon Pine-pinus edulis
- g) Limber Pine-Pinus flexilis
- h) Southwestern White Pine-Pinus flexilis reflexa
- i) Austrian Pine-Pinus nigra
- j) Ponderosa Pine-Pinus ponderosa
- k) Scotch Pine-Pinus sylvestris
- l) Engelmann Spruce-Picea engelmannii
- m) Black Hills Spruce-Picea glauca densa
- n) Colorado Spruce-Picea pungens
- o) Colorado Blue Spruce-Picea pungens glauca

#### 4. Semi-Evergreen and Broadleaf Evergreen Shrubs

- a) Kinnikinnick-Arctostaphylos uva-ursi
- b) Euonymus-Euonymus fortunei
- c) Manhattan Euonymus-Euonymus kiautschovicus 'Manhattan'
- d) Oregon Grape Holly-Mahonia aquifolium
- e) Compact Oregon Grape Holly-Mahonia aquifolium 'Compacta'
- f) Creeping Oregon Grape Holly-Mahonia repens
- g) Soapweed Yucca-Yucca glauca

#### 5. Evergreen Shrubs

- a) Armstrong Juniper-Juniper chinensis 'Armstrong'
- b) Blue Rug Juniper-Juniperous horizontalis 'Wiltonii'
- c) Sea Green Juniper-Juniperous media 'Sea Green'
- d) Green Mound Juniper-Juniperous procumbens 'Green Mound'
- e) Tammy Juniper-Juniperus sabina 'Tamariscifolia'
- f) Table Top Juniper-Juniperus scopulorum 'Table Top'
- g) Blue Star Juniper-Juniperus squamata 'Blue Star'
- h) Wichita Blue Juniper-Juniperus scopulorum 'Wichita Blue'
- i) Hillspire Juniper-Juniperus virginiana 'Cupress'
- j) Mugo Pine-Pinus mugo

#### 6. Deciduous Shrubs

- a) Serviceberry-Amelanchier spp.
- b) Barberry-Berberis thunbergii atropurpurea



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- c) Butterfly Bush-Buddleia davidii
- d) Siberian Peashrub-Caragana arborescens
- e) Flowering Quince-Chaenomeles speciosa
- f) Blue Mist Spirea-Caryopteris spp.
- g) Dogwood-Cornus sericea
- h) Smoketree-Cotinus coggygria
- i) Peking Cotoneaster-Cotoneaster acutifolia
- j) Cranberry Cotoneaster-Cotoneaster apiculatus
- k) Burning Bush-Euonymus alatus
- l) Forsythia-Ligustrum vulgare
- m) Honeysuckle- Lonicera spp.
- n) Russian Sage-Perovskia atriplicifolia
- o) Common Ninebark-Physocarpus opulifolius
- p) Potentilla (Shrubby Cinquefoil)-Potentilla fruticosa
- q) Plum-Prunus spp.

## 7. Perennials

- a) Yarrow-Achilles filipendula
- b) Columbine-Aquilegia (hybrids)
- c) Hollyhock-Althaea rosea
- d) Pearly Everlasting-Anaphalis spp.
- e) Clustered Bellflower-Campanula glomerata
- f) Canterbury Bells-Campanula medium
- g) Cup-n-Saucer-Campanula medium calycantherma
- h) Shasta Daisy-Chrysanthemum maximum
- i) Delphinium-Delphinium elatum
- j) Cottage Pink-Dianthus pulmaris
- k) Bleeding Heart-Dicentra spectabilis
- l) Foxglove-Digitalis purpurea
- m) Blanket Flower-Gaillardia aristata
- n) Bearded Iris-Iris germanica
- o) Perennial Sweet Pea-Lathyrus latifolius
- p) Blue Flax-Linum perenne
- q) Lupine-Lupinus polyphyllus
- r) Daffodil-Narcissus spp.
- s) Perennial Phlox-Phlox paniculata
- t) Buttercup-Ranunculus asiaticus
- u) Johnny Jump-up-Viola kitaibeliana

## B. USE TABLE

In the event a use is permitted in the Glenwood Meadows standards but is not permitted in the underlying zone districts, the stricter obligations of the Code shall prevail.

Prohibited Use



Special Use

| Use                                                                                            | A-Mixed-Use<br>Campus (C-1) | C, D, and M-<br>Commercial<br>(C-1) | E, F, and G-<br>Mixed-Use<br>(C-2) | I-Hospitality<br>(C-4) | S, J, and K-<br>Residential<br>Neighborhood<br>(R-3) | L-Parks and<br>Open Space (HP) |
|------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------|------------------------------------|------------------------|------------------------------------------------------|--------------------------------|
| Accessory Uses                                                                                 |                             |                                     |                                    |                        |                                                      |                                |
| Apartments                                                                                     |                             |                                     |                                    |                        |                                                      |                                |
| Auto Rental                                                                                    |                             |                                     |                                    |                        |                                                      |                                |
| Auto Repair                                                                                    |                             |                                     |                                    |                        |                                                      |                                |
| Auto Parking                                                                                   |                             |                                     |                                    |                        |                                                      |                                |
| Auto Sales                                                                                     |                             |                                     |                                    |                        |                                                      |                                |
| Auto Service                                                                                   |                             |                                     |                                    |                        |                                                      |                                |
| Auto Washing and/or<br>Polishing Facility                                                      |                             |                                     |                                    |                        |                                                      |                                |
| Banks with Drive Thru/<br>Accessory ATM<br>Facilities                                          |                             |                                     |                                    |                        |                                                      |                                |
| Bed & Breakfast                                                                                |                             |                                     |                                    |                        |                                                      |                                |
| Child Care Home                                                                                |                             |                                     |                                    |                        |                                                      |                                |
| Commercial Indoor<br>Cinema                                                                    |                             |                                     |                                    |                        |                                                      |                                |
| Daycare Facilities                                                                             |                             |                                     |                                    |                        |                                                      |                                |
| Sanitariums, Rest<br>Homes, Homes for the<br>Aged, Nursing or<br>Convalescent Homes            |                             |                                     |                                    |                        |                                                      |                                |
| Emergency Services<br>Facilities                                                               |                             |                                     |                                    |                        |                                                      |                                |
| Golf Course                                                                                    |                             |                                     |                                    |                        |                                                      |                                |
| Gas Sales                                                                                      |                             |                                     |                                    |                        |                                                      |                                |
| Governmental Facilities<br>and Non-<br>Governmental Health<br>and Human Services<br>Facilities |                             |                                     |                                    |                        |                                                      |                                |
| Government or Public<br>Utility Service                                                        |                             |                                     |                                    |                        |                                                      |                                |
| Commercial Health<br>and Fitness Centers                                                       |                             |                                     |                                    |                        |                                                      |                                |
| Home Improvement<br>and Garden Supply                                                          |                             |                                     |                                    |                        |                                                      |                                |
| Hospitals and their<br>Related Facilities                                                      |                             |                                     |                                    |                        |                                                      |                                |
| Hotels                                                                                         |                             |                                     |                                    |                        |                                                      |                                |

| Use                                                                              | A-Mixed-Use<br>Center (C-1) | C, D, and H-<br>Commercial<br>(C-1) | E, F, and G-<br>Mixed-Use<br>(C-2) | L-Hospitality<br>(C-3) | R, J, and K-<br>Residential<br>Neighborhood<br>(R-1) | L- Parks and<br>Open Space (HP) |
|----------------------------------------------------------------------------------|-----------------------------|-------------------------------------|------------------------------------|------------------------|------------------------------------------------------|---------------------------------|
| Indoor Commercial<br>Recreational Facilities                                     |                             |                                     |                                    |                        |                                                      |                                 |
| Light Assembly                                                                   |                             |                                     |                                    |                        |                                                      |                                 |
| Major Home<br>Occupation                                                         |                             |                                     |                                    |                        |                                                      |                                 |
| Membership<br>Warehouse                                                          |                             |                                     |                                    |                        |                                                      |                                 |
| Minor Home<br>Occupation                                                         |                             |                                     |                                    |                        |                                                      |                                 |
| Mobile Home<br>Manufacturing                                                     |                             |                                     |                                    |                        |                                                      |                                 |
| Mobile Home Park                                                                 |                             |                                     |                                    |                        |                                                      |                                 |
| Mobile Home Sales                                                                |                             |                                     |                                    |                        |                                                      |                                 |
| Mortuary                                                                         |                             |                                     |                                    |                        |                                                      |                                 |
| Multi-family Dwellings                                                           |                             |                                     |                                    |                        |                                                      |                                 |
| Museum                                                                           |                             |                                     |                                    |                        |                                                      |                                 |
| Non-Bank Drive-<br>Through Facilities                                            |                             |                                     |                                    |                        |                                                      |                                 |
| Office Uses                                                                      |                             |                                     |                                    |                        |                                                      |                                 |
| Office-Showroom                                                                  |                             |                                     |                                    |                        |                                                      |                                 |
| Outdoor Display                                                                  |                             |                                     |                                    |                        |                                                      |                                 |
| Outdoor Recreational<br>Facilities                                               |                             |                                     |                                    |                        |                                                      |                                 |
| Outdoor Storage                                                                  |                             |                                     |                                    |                        |                                                      |                                 |
| Clinical and their<br>Related Facilities                                         |                             |                                     |                                    |                        |                                                      |                                 |
| Pedestrian-oriented<br>Accessory Uses and<br>Outdoor Seating for<br>Restaurants. |                             |                                     |                                    |                        |                                                      |                                 |
| Public Park                                                                      |                             |                                     |                                    |                        |                                                      |                                 |
| Radio Transmission<br>Facilities                                                 |                             |                                     |                                    |                        |                                                      |                                 |
| Recreation Vehicle<br>Parking                                                    |                             |                                     |                                    |                        |                                                      |                                 |
| Religious Institutions                                                           |                             |                                     |                                    |                        |                                                      |                                 |
| Restaurants                                                                      |                             |                                     |                                    |                        |                                                      |                                 |
| Retail                                                                           |                             |                                     |                                    |                        |                                                      |                                 |
| Road, Driveway,<br>Bikeway, Parking                                              |                             |                                     |                                    |                        |                                                      |                                 |
| Schools                                                                          |                             |                                     |                                    |                        |                                                      |                                 |
| Schools: Colleges or<br>Universities                                             |                             |                                     |                                    |                        |                                                      |                                 |
| Self-Storage Facilities                                                          |                             |                                     |                                    |                        |                                                      |                                 |
| Service and Repair of<br>Appliances & Building<br>Components                     |                             |                                     |                                    |                        |                                                      |                                 |
| Personal Service such<br>as Photo Shop, Tailor,<br>Dry Cleaning, Barber          |                             |                                     |                                    |                        |                                                      |                                 |
| Single Family Detached<br>Dwellings                                              |                             |                                     |                                    |                        |                                                      |                                 |
| Single-Family Attached<br>Housing e.g.<br>Townhouses and ...                     |                             |                                     |                                    |                        |                                                      |                                 |

| Use                                                            | A-Mixed-Use<br>Complex (C-1) | C, D, and H-<br>Commercial<br>(C-1) | E, F, and G-<br>Mixed-Use<br>(C-2) | I-Hospitality<br>(C-4) | S, J, and K-<br>Residential<br>Neighborhood<br>(R-3) | L- Parks and<br>Open Space (HP) |
|----------------------------------------------------------------|------------------------------|-------------------------------------|------------------------------------|------------------------|------------------------------------------------------|---------------------------------|
| Roughhouses                                                    |                              |                                     |                                    |                        |                                                      |                                 |
| Skating Rinks, Public<br>Recreational and Sports<br>Facilities |                              |                                     |                                    |                        |                                                      |                                 |
| Small Animal Hospitals<br>and Clinics                          |                              |                                     |                                    |                        |                                                      |                                 |
| Transient<br>Housing/Boarding<br>Houses                        |                              |                                     |                                    |                        |                                                      |                                 |
| Transit Park and Ride/<br>Bus Station                          |                              |                                     |                                    |                        |                                                      |                                 |
| Utility Substations                                            |                              |                                     |                                    |                        |                                                      |                                 |

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## XIII. Definitions

**Accessory Use**—A use incidental and subordinate to the principal use of the lot.

**Apartment**- A type of multi-family dwelling unit, typically renter-rather than owner-occupied. See definition for multi-family dwellings below.

**Auto Parking**—Shall mean an off-street parking area or vehicular use area, an off-street parking area within a building or parking structure, or on street parallel or diagonal parking.

**Day Care**—A child care facility or day nursery, which is maintained for the whole or part of a day for the care of 7 or more children unrelated to the owner on a full time basis and/or requiring a day care nursery or a center license in accordance with the regulations of the State of Colorado Department of Social Services, whether such facility is operated with or without compensation for such care and with or without stated educational purposes.

**Indoor Recreation**—A commercial recreational land use conducted entirely within a building, including: an arcade, arena, art gallery and studio, art center, assembly hall, athletic and health clubs, auditorium, bowling alley, club or lounge, community center, conference center, exhibit hall, gymnasium, library, movie theater, museum, performance theater, pool or billiard hall, skating rink, swimming pool, or tennis court.

**Multi-family dwellings**—A building containing 3 or more dwelling units, not including hotels, motels, and similar group accommodations.

**Non-banking Drive Thru**—An establishment which by design, physical facilities, services, or packaging procedures encourages or permits customers to receive services, obtain goods, or be entertained while remaining in their motor vehicles.

**Open Space**—That portion of a building lot which is open to the sky, except as provided in the definition of lot coverage.

**Outdoor Recreation**—A commercial recreational land use conducted outside of a building, characterized by a minimal impact on traffic, the natural environment, or the surrounding neighborhood, including: an arboretum, botanical garden, bridle or hiking trails, country club, golf course, or historic site.

**Pedestrian-oriented Development**—Development that is designed with a primary emphasis on the street sidewalk and/or connecting walkway access to the site and building rather than on auto access and parking lots. This type of development typically warrants buildings being placed relatively close to the street with the main entrance oriented towards the street sidewalk or a walkway. Parking areas are provided but are not emphasized in the design of the site.

**Transit-oriented Development**—A development pattern characterized by mixed-use development at transit corridors, a high level of activities and extensive facilities for transit users, pedestrians, and bicyclists to provide easy movement between living and working environments.



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**FIRST AMENDMENT TO**  
**ANNEXATION AND DEVELOPMENT AGREEMENT**  
**GLENWOOD MEADOWS, LLC ANNEXATION**

**THIS FIRST AMENDMENT TO ANNEXATION AND DEVELOPMENT AGREEMENT** ("Agreement") is made and entered into this 5th day of May, 2004, by and between the CITY OF GLENWOOD SPRINGS, COLORADO, a Colorado municipal corporation (hereinafter "City"), and GLENWOOD MEADOWS, LLC, a Colorado limited liability company, its successors, assigns, and its legal or other representatives (hereinafter collectively "Owner").

**WITNESSETH:**

WHEREAS, Owner owns approximately three hundred forty-five (345) acres of real property currently located in unincorporated Garfield County, Colorado, and more particularly described on Exhibit A, attached hereto and incorporated herein by this reference (hereinafter "Property"), which Property shall be known as "Glenwood Meadows"; and

WHEREAS, on July 18, 2002, the City Council of the City of Glenwood Springs ("Council") did adopt Ordinance No. 17, Series of 2002, and Ordinance No. 18, Series of 2002, which respectively approved the Owner's petition and request for annexation of the Property and approved the Owner's application for municipal zoning of the Property; and

WHEREAS, the City and Owner entered into this an Annexation and Development Agreement to set forth their agreements in writing concerning the terms and conditions of annexation of the Property to the City, the zoning of the Property under the City's Municipal Code and the adopted Zoning and Development Plan, as well as the other conditions of the development of the Property; and

WHEREAS, certain conditions have changed necessitating the amendment of the Annexation and Development Agreement recorded December 6, 2002 at Reception No. #616083.

**NOW THEREFORE**, the Annexation and Development Agreement entered into by and between the parties is amended as follows (deletions are shown by ~~strike-through~~ additions are underlined):

**Section 12 Off-Site Traffic Improvements Obligations.**

\*  
\*  
\*

- f. The third sentence shall be amended to read as follows "Owner shall be responsible for one hundred percent (100%) of the cost of construction of a new limited purpose (~~i.e. an unsignalized right turn in/right turn out only~~) access point from the Property to Midland Avenue."

Section 13. On-Site Pedestrian/Off-Site Pedestrian Commitments, Transportation Demand Management Commitment; and Transit Commitments.

\*

\*

\*

- d. An additional sentence shall be added to the end of this subsection to read as follows "The subdivision, conveyance and development of a park and ride of any acreage as contemplated herein shall not obligate the Owner to perform any obligation set forth in this Agreement which would otherwise be required as the result of subdivision, conveyance or development of any of the Property."

Section 20. Miscellaneous. Section 20, Subsection 1. Notice, is amended as follows:

1. Notice.

:

Notice to City: City of Glenwood Springs  
~~Mike Copp~~, City Manager  
~~806 Cooper Avenue~~ 101 West 8<sup>th</sup> Street  
City of Glenwood Springs, CO 81601

With copy to: ~~Teresa Williams~~  
City Attorney  
~~806 Cooper Avenue~~ 101 West 8<sup>th</sup> Street  
Glenwood Springs, CO 81601

Notice to Owner: Glenwood Meadows, L.L.C.  
Attn: Robert Macgregor  
~~525 East Cooper~~  
1315 Sage Court  
Aspen, CO 81611

With copy to: Thomas J. Hartert, Esq.  
~~802 Grand Avenue, Suite~~  
818 Colorado Avenue  
P.O. Drawer 790  
Glenwood Springs, CO 81602

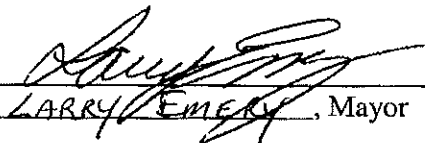
Except as expressly amended hereby, all other terms, conditions and provisions of the Annexation and Development Agreement – Glenwood Meadows, LLC Annexation dated September 18, 2002 shall remain in full force and effect.

**WHEREFORE**, the parties hereto have executed duplicate originals of this Agreement on the day and year first written above.



651648 05/06/2004 02:29P B1585 P440 M ALSDORF  
3 of 4 R 21.00 D 0.00 GARFIELD COUNTY CO

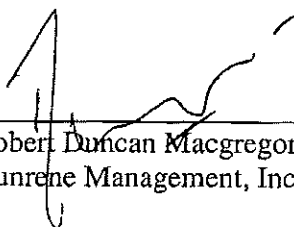
CITY OF GLENWOOD SPRINGS, COLORADO

By , Mayor

ATTEST:

  
Robin Clemons, City Clerk

GLENWOOD MEADOWS, LLC, a Colorado  
limited liability company

By   
Robert Duncan Macgregor as President of  
Dunrene Management, Inc., the Manager

STATE OF COLORADO )  
 ) ss.  
COUNTY OF GARFIELD )

Acknowledged, subscribed and sworn to before me this 27th day of April,  
2004, by Larry Emery as Mayor, and by Robin Clemons as Clerk, on behalf of the  
City of Glenwood Springs.

WITNESS my hand and official seal.

My Commission expires: MY COMMISSION EXPIRES 11/28/2005

  
Notary Public

STATE OF COLORADO )  
 ) ss.  
COUNTY OF GARFIELD )

Acknowledged, subscribed and sworn to before me this 3rd day of May,  
2004, by Robert Duncan Macgregor as President of Dunrene Management, Inc., the Manager of  
Glenwood Meadows, L.L.C.

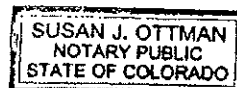


651648 05/06/2004 02:29P B1585 P441 M ALSDORF  
4 of 4 R 21.00 D 0.00 GARFIELD COUNTY CO

WITNESS my hand and official seal.

My Commission expires: 11/2/05

Notary Public



My Commission Expires 11/02/2005  
County of Mesa



LAND TITLE GUARANTEE COMPANY  
901 GRAND AVENUE #202  
GLENWOOD SPRINGS, CO 81601  
Phone: (970) 930-9815  
Fax: (800) 318-8206

**"PURCHASERS"  
STATEMENT OF  
SETTLEMENT**

PROPERTY ADDRESS: 2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601

SELLER(S): CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY

BUYER(S): ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY

SETTLEMENT DATE: July 08, 2020

DATE OF PRORATION: July 08, 2020

| DESCRIPTION                                                 | DEBIT        | CREDIT              |
|-------------------------------------------------------------|--------------|---------------------|
| <b>Sales Price &amp; Earnest Money</b>                      |              |                     |
| Sales Price                                                 | 1,260,000.00 |                     |
| <b>Title Fees - Land Title Guarantee Company</b>            |              |                     |
| Tax Certificate                                             | 26.00        |                     |
| <b>Closing Fees - Land Title Guarantee Company</b>          |              |                     |
| Closing Fee to Land Title Guarantee Company                 | 275.00       |                     |
| <b>Recording Fees - Land Title Guarantee Company</b>        |              |                     |
| Record Warranty Deed to Land Title Guarantee Company        | 23.00        |                     |
| Documentary Fee to Land Title Guarantee Company             | 126.00       |                     |
| <b>Water &amp; Sewer Charges - CITY OF GLENWOOD SPRINGS</b> |              |                     |
| TRANSFER FEE to CITY OF GLENWOOD SPRINGS                    | 15.00        |                     |
| <b>SubTotals</b>                                            | 1,260,465.00 | 0.00                |
| Due from Buyer/Borrower                                     |              | <b>1,260,465.00</b> |
| <b>Totals</b>                                               | 1,260,465.00 | 1,260,465.00        |

The above figures do not include sales or use taxes on property

APPROVED AND ACCEPTED

**PURCHASER(S)**

ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY

By: *Dan Blankenship*

DAN BLANKENSHIP, CEO

**LAND TITLE CLOSING AGENT:**

*Jessica Reed*

Jessica Reed





LAND TITLE GUARANTEE COMPANY  
901 GRAND AVENUE #202  
GLENWOOD SPRINGS, CO 81601  
Phone: (970) 930-9815  
Fax: (800) 318-8206

**"SELLERS"  
STATEMENT OF  
SETTLEMENT**

PROPERTY ADDRESS: 2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601

SELLER(S): CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY

BUYER(S): ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY

SETTLEMENT DATE: July 08, 2020

DATE OF PRORATION: July 08, 2020

| DESCRIPTION                                              | DEBIT               | CREDIT              |
|----------------------------------------------------------|---------------------|---------------------|
| <b>Sales Price &amp; Earnest Money</b>                   |                     |                     |
| Sales Price                                              |                     | 1,260,000.00        |
| <b>Title Fees - Land Title Guarantee Company</b>         |                     |                     |
| Title Insurance ALTA Owner's Policy                      | 2,862.00            |                     |
| <b>Closing Fees - Land Title Guarantee Company</b>       |                     |                     |
| Closing Fee to Land Title Guarantee Company              | 275.00              |                     |
| Escrow Set Up Fee to Land Title Guarantee Company        | 50.00               |                     |
| <b>Miscellaneous Charges</b>                             |                     |                     |
| ESCROW FOR REMEDIATE RECOGNIZED ENVIRONMENTAL CONDITIONS | 50,000.00           |                     |
| <b>SubTotals</b>                                         | 53,187.00           | 1,260,000.00        |
| Due to Seller/Owner                                      | <b>1,206,813.00</b> |                     |
| <b>Totals</b>                                            | <b>1,260,000.00</b> | <b>1,260,000.00</b> |

The above figures do not include sales or use taxes on property

APPROVED AND ACCEPTED

**SELLER(S)**

CITY OF GLENWOOD SPRINGS, A COLORADO HOME-  
RULE MUNICIPALITY

**LAND TITLE CLOSING AGENT:**

*Jonathan Godes*

By: \_\_\_\_\_  
Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM

*Jessica Reed*

\_\_\_\_\_  
Jessica Reed





## COMMERCIAL CLOSING INSTRUCTIONS

TO: Land Title Guarantee Company

RE: 2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601

1. The Seller(s) and Buyer(s) listed below employ Land Title Guarantee Company (hereinafter referred to as Closing Agent) to act as closing and settlement agent in connection with the real property identified in title commitment No. **63014212**.
2. Closing Agent is authorized to prepare, obtain, deliver and record all documents (including if applicable the Warranty Deed), excluding preparation of legal documents, necessary to carry out the terms and conditions of the Contract by and between the undersigned with amendments and counter proposals attached. Closing Agent is authorized to act as Loan Closing Agent and, if required, as custodian for any lender selected under the terms of the contract.
3. Closing Agent is authorized to receive funds; and to disburse funds under the following conditions:
  - a. All funds received are either available for immediate withdrawal as a matter of right from the financial institution in which funds have been deposited; or are available for immediate withdrawal as a consequence of an agreement of a financial institution in which the funds are to be deposited or a financial institution upon which the funds are to be drawn.
4. Seller(s) and Buyer(s) will furnish any additional information and documents required by Closing Agent which will be necessary to complete this transaction, and to comply with the provision of the Contract.
5. Closing Agent will prepare and deliver an accurate and detailed Closing Statement to Seller(s) and Buyer(s) at time of closing.
6. Nothing contained herein shall be construed to alter or supersede the Contract.
7. Should a default occur by either Seller(s) or Buyer(s), Closing Agent is authorized to return all documents, monies, and things of value to the depositing party and Closing Agent will be relieved from any further duty, responsibility or liability in connection with these instructions.
8. In the event of any conflicting demands made on the Closing Agent concerning these instructions, in the sole judgment of the Closing Agent, and at the election of the Closing Agent, Closing Agent may hold any monies, documents, and things of value until Closing Agent received mutual written instructions from Seller(s) and Buyer(s) or until a civil action shall have been finally concluded in a court of competent jurisdiction, determining the rights of all parties. In the alternative, Closing Agent may, at its discretion, at any time, commence a civil action to interplead any conflicting demands to a court of competent jurisdiction. Deposit with the court by the Closing Agent of all monies, documents, and other things of value concerning this transaction, shall relieve Closing Agent of all further liability and responsibility.
9. These closing instructions may be amended or terminated by written instructions from the Seller(s) and Buyer(s) to the Closing Agent.

### ADDITIONAL PROVISIONS. (The following provisions have not been approved by the Colorado Real Estate Commission)

Seller and Borrower agree that the documents necessary for closing that require a notarization or acknowledgment may be notarized by a notary located outside of the State of Colorado through a process called "Remote Online Notarization ("RON"). The RON process utilizes an electronic online platform in which a notary will use real time audio/visual equipment to witness a party's electronic signature, and notarize it electronically from a remote location. If the parties elect to utilize RON to notarize closing documents, the role of the notary in the closing process will be limited to notarizing specific closing documents. If RON is utilized in this closing, the parties hereby authorize Closing Company to upload closing documents to the RON platform that is selected by the Closing Company, which documents could include personal private information; these documents could include but are not limited to deeds, deeds of trust, and affidavits. Once the closing documents are uploaded onto the RON platform, Closing Company is not responsible for the security or privacy of those uploaded documents.

APPROVED AND ACCEPTED: July 08, 2020

#### SELLER(S)

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

By: \_\_\_\_\_  
Jonathan Godes, Mayor

#### BUYER(S)

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

By: \_\_\_\_\_  
DAN BLANKENSHIP, CEO

Land Title Guarantee Company

*Jessica Reed*

Jessica Reed



## COMMERCIAL CLOSING INSTRUCTIONS

TO: Land Title Guarantee Company

RE: 2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601

1. The Seller(s) and Buyer(s) listed below employ Land Title Guarantee Company (hereinafter referred to as Closing Agent) to act as closing and settlement agent in connection with the real property identified in title commitment No. **63014212**.
2. Closing Agent is authorized to prepare, obtain, deliver and record all documents (including if applicable the Warranty Deed), excluding preparation of legal documents, necessary to carry out the terms and conditions of the Contract by and between the undersigned with amendments and counter proposals attached. Closing Agent is authorized to act as Loan Closing Agent and, if required, as custodian for any lender selected under the terms of the contract.
3. Closing Agent is authorized to receive funds; and to disburse funds under the following conditions:
  - a. All funds received are either available for immediate withdrawal as a matter of right from the financial institution in which funds have been deposited; or are available for immediate withdrawal as a consequence of an agreement of a financial institution in which the funds are to be deposited or a financial institution upon which the funds are to be drawn.
4. Seller(s) and Buyer(s) will furnish any additional information and documents required by Closing Agent which will be necessary to complete this transaction, and to comply with the provision of the Contract.
5. Closing Agent will prepare and deliver an accurate and detailed Closing Statement to Seller(s) and Buyer(s) at time of closing.
6. Nothing contained herein shall be construed to alter or supersede the Contract.
7. Should a default occur by either Seller(s) or Buyer(s), Closing Agent is authorized to return all documents, monies, and things of value to the depositing party and Closing Agent will be relieved from any further duty, responsibility or liability in connection with these instructions.
8. In the event of any conflicting demands made on the Closing Agent concerning these instructions, in the sole judgment of the Closing Agent, and at the election of the Closing Agent, Closing Agent may hold any monies, documents, and things of value until Closing Agent received mutual written instructions from Seller(s) and Buyer(s) or until a civil action shall have been finally concluded in a court of competent jurisdiction, determining the rights of all parties. In the alternative, Closing Agent may, at its discretion, at any time, commence a civil action to interplead any conflicting demands to a court of competent jurisdiction. Deposit with the court by the Closing Agent of all monies, documents, and other things of value concerning this transaction, shall relieve Closing Agent of all further liability and responsibility.
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### ADDITIONAL PROVISIONS. (The following provisions have not been approved by the Colorado Real Estate Commission)

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APPROVED AND ACCEPTED: July 08, 2020

#### SELLER(S)

CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY

*Jonathan Godes*

By: \_\_\_\_\_  
Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM

#### BUYER(S)

ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY

By: \_\_\_\_\_  
DAN BLANKENSHIP, CEO

Land Title Guarantee Company

*Jessica Reed*

Jessica Reed





**FOREIGN INVESTMENT IN REAL PROPERTY TAX ACT OF 1980  
(26 U.S.C. 1445) ("FIRPTA")**

**CERTIFICATION BY TRANSFEROR (ENTITY)  
(Pursuant to Regulation C.F.R.1.1445-2(b)(2)(i))**

To: **ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**, (hereinafter referred to as the "Transferee",)

Section 1445 of the Internal Revenue Code provides that a transferee of a U. S. real property interest must withhold tax if the transferor is a foreign person. For U.S. tax purposes (including section 1445), the owner of a disregarded entity (which is legal title to a U.S. real property interest under local law) will be the transferor of the property and not the disregarded entity.

To inform the transferee that withholding of tax is not required upon the disposition of a U. S. real property interest, by **CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**, hereinafter referred to as the transferor, the undersigned hereby certifies the following on behalf of the transferor:

1. The transferor is not a foreign corporation, foreign partnership, foreign trust, or foreign estate (as those items are defined in the Internal Revenue Code and Income Tax Regulation);
2. The transferor is not a disregarded entity as defined in section 1.1445-2(b)(iii);
3. The transferor's U.S. employer identification number is [REDACTED]; and
4. The transferor's office address is:  
[REDACTED]
5. The transferor understands that this certification will be disclosed to the Internal Revenue Service by the transferee and that any false statement contained therein could be punished by fine, imprisonment, or both.
6. Under penalties of perjury I declare that I have examined this certification and to the best of my knowledge and belief it is true, correct and complete, and I further declare that I have authority to sign this document on behalf of the transferor (i.e. a responsible officer if a corporation, by a general partner if a partnership, and by a trustee or equivalent fiduciary of the case of a trust or estate).

All information required to be obtained in connection with document has been obtained from information supplied by the transferor to Land Title Guarantee Company. For privacy and security reasons, Land Title will retain this information. In the event you are contacted by the Internal Revenue Service concerning FIRPTA, please contact the Company immediately for a copy of this Affidavit which discloses the transferor's Tax Identification Number.

Date: 07/08/2020

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-  
RULE MUNICIPALITY**

*Jonathan Godes*

By: \_\_\_\_\_  
**Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM**

**Note:**

1. If you have any questions or concerns arising from your obligation as transferor in regard to this tax, it is suggested that you immediately contact your local Internal Revenue Service office, attorney or accountant if you do not fully understand these regulations. More information, including the regulations promulgated under FIRPTA, is available at the website for the Internal Revenue Service, <https://www.irs.gov/>
2. The transferee is required to retain this certification until the end of the fifth taxable year following the taxable year in which the transfer takes place. The transferee must make this certification available to the Internal Revenue Service when requested in accordance with the requirements of 26 U.S.C 6001 and regulations thereunder.



### Agreement for Taxes

It is hereby understood and agreed between the Buyer(s) and Seller(s) of the property known as: **2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601**

☐ Other:

This adjustment shall be:

☒ A final settlement.

☐ Re-adjusted between the Buyer(s) and Seller(s) as soon as the taxes have been billed by the County Treasurer. If a re-adjustment is necessary, Land Title Guarantee Company will not make or be responsible for this re-adjustment.

It is further understood and agreed between the Buyer(s) and Seller(s) that:

☐ No governmental body taxing authority has certified an assessment lien to the County Treasurer for special improvements installed prior to the date of the Buyer's execution of the Agreement for Purchase.

☐ Special Taxing District Assessments being paid in annual installments are to be assumed by the Buyer(s), with current annual assessments in the amount of **\$0.00**, with the total payoff amount of this assessment being **\$0.00**. This assessment will be fully paid on \_\_\_\_\_.

Note: Land Title Guarantee Company and/or its underwriter assumes no responsibility or any liability for the adjustment of special taxes on assessments unless they are shown on the County Treasurer's Certificate of Taxes Due. Any adjustment shall be made between the Buyer's and Seller(s), if necessary, and Land Title Guarantee Company, or its underwriter will not make or be responsible for the re-adjustment or liability in connection therewith.

This Agreement made and executed this day of **July 8th, 2020**

**Seller(s)**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

By: \_\_\_\_\_

**Jonathan Godes, Mayor**

**Buyer(s)**

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

By: \_\_\_\_\_

**DAN BLANKENSHIP, CEO**



## Agreement for Taxes

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Note: Land Title Guarantee Company and/or its underwriter assumes no responsibility or any liability for the adjustment of special taxes on assessments unless they are shown on the County Treasurer's Certificate of Taxes Due. Any adjustment shall be made between the Buyer's and Seller(s), if necessary, and Land Title Guarantee Company, or its underwriter will not make or be responsible for the re-adjustment or liability in connection therewith.

This Agreement made and executed this day of **July 8th, 2020**

**Seller(s)**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

*Jonathan Godes*

By: \_\_\_\_\_

**Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM**

**Buyer(s)**

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

By: \_\_\_\_\_  
**DAN BLANKENSHIP, CEO**



## Utility Agreement

### Water and Sewer Escrow

At the closing of **2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601** (Property Address) on **July 8th, 2020** (Date), by Land Title Guarantee Company, both the Buyer(s) and Seller(s) fully understand that Land Title Guarantee Company DOES NOT notify the telephone company, the electric and/or gas company(s), the cable company or the Seller's present insurance company to cancel or transfer to the new owners, any of the above.

**IT IS THE SELLER(S) RESPONSIBILITY** to call the gas and/or electric company for a final reading and to give them your forwarding address for the final bill. It is also the Seller(s) responsibility to notify your telephone company, cable company, trash company and your present insurance agent.

**IT IS THE BUYER(S) RESPONSIBILITY** to call the gas and/or electric company, giving them the personal information they may require for their records, the telephone company, the trash company and the cable company to put service into your name(s) with the correct mailing address, if different than the property just purchased.

The final reading of the metered water/sewer account or the proration of the standard bill is to be handled on **July 08, 2020**.

LAND TITLE GUARANTEE COMPANY is escrowing \_\_\_\_\_ from the Seller(s) and/or \$ \_\_\_\_\_ from the Buyer(s).

The Parties hereto further agree to the following:

The undersigned Buyer(s) and Seller(s) of the property referenced above understand that Land Title Guarantee Company is escrowing for the final water and sewer charges. Upon receipt of the final bill for water and sewer, Land Title Guarantee Company will pay and refund any monies in excess of the final bill to the applicable party. Land Title Guarantee Company is hereby instructed to order the meter reading to be done on the day of closing unless specifically instructed to do otherwise by the undersigned parties. In the event the water and sewer charges exceed the escrowed amount, any additional charges are the responsibility of the Seller(s) and/or Buyer(s). Land Title Guarantee Company or its underwriter shall not make or be responsible for the additional charges. The Buyer(s) and Seller(s) further understand that the water/sewer billing was based on a verbal quote and/or written status letter from the sewer company. Land Title Guarantee Company or its underwriter assumes no responsibility or any liability in the event the figures were misquoted by the clerk at the water/sewer company or any mistakes made on the written status letter. Any adjustment shall be made between the Buyer(s) and Seller(s), if necessary, and Land Title Guarantee Company or its underwriter, will not make or be responsible for this re-adjustment or any liability in connection therewith.

FURTHER, Seller acknowledges that there [ ☐ ] is [ ☒ ] is not currently a formal or informal homeowners/landowners association and/or sub-association which may require periodic assessments and other fees as a result of this transaction. If there is an association and/or sub-association heretofore not known to the settlement agent and/or seller's agent, Land Title Guarantee Company shall escrow funds from seller pending receipt of a written status letter from the association. Land Title Guarantee Company is hereby instructed to pay the amount stated on said status letter.

In the event the homeowners'/landowners' association dues, assessments or fees exceed the escrowed amount, the additional charges are the responsibility of the Seller(s). Land Title Guarantee Company or its underwriter shall not make or be responsible for the additional charges.

If there is a formal or informal homeowners'/landowners' association involved and if that association has requested copies of the Buyer and Seller Settlement Statements as a requirement to transfer their records to the new owners, the undersigned hereby authorize Land Title Guarantee Company to deliver a copy of said statements to that association. Land Title Guarantee Company is hereby released of any liability in connection with same.

This Agreement was made and executed this day of **July 8th, 2020**

**Seller:**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

**By:** \_\_\_\_\_

**Jonathan Godes, Mayor**

**Buyer:**

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

**By:** \_\_\_\_\_

**DAN BLANKENSHIP, CEO**





## Utility Agreement

### Water and Sewer Escrow

At the closing of **2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601** (Property Address) on **July 8th, 2020** (Date), by Land Title Guarantee Company, both the Buyer(s) and Seller(s) fully understand that Land Title Guarantee Company DOES NOT notify the telephone company, the electric and/or gas company(s), the cable company or the Seller's present insurance company to cancel or transfer to the new owners, any of the above.

**IT IS THE SELLER(S) RESPONSIBILITY** to call the gas and/or electric company for a final reading and to give them your forwarding address for the final bill. It is also the Seller(s) responsibility to notify your telephone company, cable company, trash company and your present insurance agent.

**IT IS THE BUYER(S) RESPONSIBILITY** to call the gas and/or electric company, giving them the personal information they may require for their records, the telephone company, the trash company and the cable company to put service into your name(s) with the correct mailing address, if different than the property just purchased.

The final reading of the metered water/sewer account or the proration of the standard bill is to be handled on **July 08, 2020**.

LAND TITLE GUARANTEE COMPANY is escrowing \_\_\_\_\_ from the Seller(s) and/or \$ \_\_\_\_\_ from the Buyer(s).

The Parties hereto further agree to the following:

The undersigned Buyer(s) and Seller(s) of the property referenced above understand that Land Title Guarantee Company is escrowing for the final water and sewer charges. Upon receipt of the final bill for water and sewer, Land Title Guarantee Company will pay and refund any monies in excess of the final bill to the applicable party. Land Title Guarantee Company is hereby instructed to order the meter reading to be done on the day of closing unless specifically instructed to do otherwise by the undersigned parties. In the event the water and sewer charges exceed the escrowed amount, any additional charges are the responsibility of the Seller(s) and/or Buyer(s). Land Title Guarantee Company or its underwriter shall not make or be responsible for the additional charges. The Buyer(s) and Seller(s) further understand that the water/sewer billing was based on a verbal quote and/or written status letter from the sewer company. Land Title Guarantee Company or its underwriter assumes no responsibility or any liability in the event the figures were misquoted by the clerk at the water/sewer company or any mistakes made on the written status letter. Any adjustment shall be made between the Buyer(s) and Seller(s), if necessary, and Land Title Guarantee Company or its underwriter, will not make or be responsible for this re-adjustment or any liability in connection therewith.

FURTHER, Seller acknowledges that there [      ] is [ **X** ] is not currently a formal or informal homeowners/landowners association and/or sub-association which may require periodic assessments and other fees as a result of this transaction. If there is an association and/or sub-association heretofore not known to the settlement agent and/or seller's agent, Land Title Guarantee Company shall escrow funds from seller pending receipt of a written status letter from the association. Land Title Guarantee Company is hereby instructed to pay the amount stated on said status letter.

In the event the homeowners'/landowners' association dues, assessments or fees exceed the escrowed amount, the additional charges are the responsibility of the Seller(s). Land Title Guarantee Company or its underwriter shall not make or be responsible for the additional charges.

If there is a formal or informal homeowners'/landowners' association involved and if that association has requested copies of the Buyer and Seller Settlement Statements as a requirement to transfer their records to the new owners, the undersigned hereby authorize Land Title Guarantee Company to deliver a copy of said statements to that association. Land Title Guarantee Company is hereby released of any liability in connection with same.

This Agreement was made and executed this day of **July 8th, 2020**

**Seller:**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

*Jonathan Godes*

**By:**

**Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM**

**Buyer:**

**ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY**

**By:**

**DAN BLANKENSHIP, CEO**



## **DISCLOSURES**

The undersigned hereby acknowledge that they understand and agree to the following provisions:

### **Laws Relating to Unclaimed Funds**

All parties are hereby advised that checks issued by Land Title Guarantee Company ("Land Title") and not cashed by the payee are subject to laws of escheat and/or unclaimed property. Should Land Title transfer such funds to a state office, pursuant to such laws, Land Title shall be released from all further responsibility under this agreement and shall not be liable to any Party.

### **FDIC Limit Notice**

The insurance coverage provided by the Federal Deposit Insurance Corporation protects a depositor up to cumulative maximum deposit of \$250,000.00 for each insured financial institution. Ownership is determined by the deposit records of the financial institution and/or the records of the named custodian of any escrow accounts. Land Title and its underwriter assume no responsibility for nor will the undersigned hold same liable for any loss which arises from the fact that the amount of the above deposit may cause the aggregate amount of any individual depositor's accounts to exceed \$250,000.00.

### **Funds Held by Land Title**

Land Title shall deposit all funds received pursuant to any closing and settlement services separate and apart from the assets of the company, in an account designated as an escrow account or custodial account and so recognized by the depository institution in the name of Land Title as Escrow Agent (Escrow Account). Similar deposits from other customers conducting other real estate transactions are included in this Escrow Account. The majority of these funds are received at closing and on completion of the transaction, are disbursed for the benefit of the seller, buyer or in the case of a refinance, for the benefit of the owner.

Land Title will pay any and all costs associated with the use of the Escrow Account, but in order to help keep settlement costs and fees down, Land Title may arrange for the bank to provide it with a number of services at a reduced rate, or at no charge, or may earn interest on the Escrow Account balance. Interest earned, if any, shall be paid to Land Title. In no event will any such arrangement restrict or limit in any way the disbursement of the funds you deposit in accordance with the instructions given by you and the Statement of Settlement relating to your transaction.

The party for whose benefit the funds are disbursed (most often the seller or owner, in the case of a refinance) may elect to have a portion of the interest earned on the fiduciary funds in the Escrow Account paid to that party. If the seller or owner makes this election, please (i) inform Land Title immediately, (ii) check the box provided below on this form and (iii) complete an IRS Form W-9 (which will be provided by Land Title). It is important to know that the fiduciary funds cannot be placed in a separate interest bearing account for that party's benefit until Land Title is in receipt of all required forms. A non-refundable administrative fee of \$50.00 will be collected by Land Title as compensation for processing the documentation, set up and transfer of funds to the separate account, maintaining of audit and reconciliation records and coordinating the tax documentation.

Authorized and accepted this day of July 8th, 2020.

#### **Seller(s):**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

By: \_\_\_\_\_

**Jonathan Godes, Mayor**

#### **Buyer(s):**

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

By: \_\_\_\_\_

**DAN BLANKENSHIP, CEO**

If the election is made to have a portion of the interest earned on the fiduciary funds in the Escrow Account paid to you, please check the appropriate box below.

|                                            |
|--------------------------------------------|
| <input checked="checked" type="checkbox"/> |
| <input type="checkbox"/>                   |
| <input type="checkbox"/>                   |

Seller hereby elects to have Seller's fiduciary funds invested and agrees to the administrative fee of \$50.00.

Buyer hereby elects to have Buyer's fiduciary funds invested and agrees to the administrative fee of \$50.00.

Owner (Refinance) hereby elects to have Owner's fiduciary funds invested and agrees to the administrative fee of \$50.00.



## **DISCLOSURES**

The undersigned hereby acknowledge that they understand and agree to the following provisions:

### **Laws Relating to Unclaimed Funds**

All parties are hereby advised that checks issued by Land Title Guarantee Company ("Land Title") and not cashed by the payee are subject to laws of escheat and/or unclaimed property. Should Land Title transfer such funds to a state office, pursuant to such laws, Land Title shall be released from all further responsibility under this agreement and shall not be liable to any Party.

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### **Funds Held by Land Title**

Land Title shall deposit all funds received pursuant to any closing and settlement services separate and apart from the assets of the company, in an account designated as an escrow account or custodial account and so recognized by the depository institution in the name of Land Title as Escrow Agent (Escrow Account). Similar deposits from other customers conducting other real estate transactions are included in this Escrow Account. The majority of these funds are received at closing and on completion of the transaction, are disbursed for the benefit of the seller, buyer or in the case of a refinance, for the benefit of the owner.

Land Title will pay any and all costs associated with the use of the Escrow Account, but in order to help keep settlement costs and fees down, Land Title may arrange for the bank to provide it with a number of services at a reduced rate, or at no charge, or may earn interest on the Escrow Account balance. Interest earned, if any, shall be paid to Land Title. In no event will any such arrangement restrict or limit in any way the disbursement of the funds you deposit in accordance with the instructions given by you and the Statement of Settlement relating to your transaction.

**The party for whose benefit the funds are disbursed (most often the seller or owner, in the case of a refinance) may elect to have a portion of the interest earned on the fiduciary funds in the Escrow Account paid to that party. If the seller or owner makes this election, please (i) inform Land Title immediately, (ii) check the box provided below on this form and (iii) complete an IRS Form W-9 (which will be provided by Land Title).** It is important to know that the fiduciary funds cannot be placed in a separate interest bearing account for that party's benefit until Land Title is in receipt of all required forms. A non-refundable administrative fee of \$50.00 will be collected by Land Title as compensation for processing the documentation, set up and transfer of funds to the separate account, maintaining of audit and reconciliation records and coordinating the tax documentation.

Authorized and accepted this day of **July 8th, 2020**.

#### **Seller(s):**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

*Jonathan Godes*

By: \_\_\_\_\_  
**Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM**

#### **Buyer(s):**

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

By: \_\_\_\_\_  
**DAN BLANKENSHIP, CEO**

If the election is made to have a portion of the interest earned on the fiduciary funds in the Escrow Account paid to you, please check the appropriate box below.

|                          |
|--------------------------|
| <input type="checkbox"/> |
| <input type="checkbox"/> |
| <input type="checkbox"/> |

Seller hereby elects to have Seller's fiduciary funds invested and agrees to the administrative fee of \$50.00.

Buyer hereby elects to have Buyer's fiduciary funds invested and agrees to the administrative fee of \$50.00.

Owner (Refinance) hereby elects to have Owner's fiduciary funds invested and agrees to the administrative fee of \$50.00.



## Approval of Deed, Bill of Sale and Tenancy

The undersigned **ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY** Buyer(s) hereby acknowledge that they intend to take title to the following described property:

**PARCEL A:**

**LOT A (AMENDED), FIRST AMENDED MINOR SUBDIVISION PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER, IN THE CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO.**

**PARCEL B:**

**THE ENTIRE PARCEL IDENTIFIED AS "MOC DRIVEWAY" IN THE SUBDIVISION PLAT OF GLENWOOD MEADOWS NO. 1, RECORDED AUGUST 9, 2004 AT RECEPTION NO. 657438 IN THE GARFIELD COUNTY CLERK AND RECORDERS OFFICE, ALSO LYING IN THE SW1/4 SECTION 5, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF GARFIELD, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:**

**BEGINNING AT AN ANGLE POINT ON SAID "MOC DRIVEWAY", BEING A FOUND 5/8 REBAR AND 1.25" YELLOW PLASTIC CAP MARKED LS 38145 "V3", WHENCE THE COMMON SECTION CORNER FOR SECTIONS 5, 6, 7, AND 8 OF TOWNSHIP 6 SOUTH, RANGE 89 WEST, BEING A FOUND 2.5" ALUMINUM PIPE AND 3.25" ALUMINUM DOI/USBLM CAP PROPERLY MARKED AND DATED 1995 BEARS S69° 40' 34"W A DISTANCE OF 1079.31', ALSO BEING THE BASIS OF BEARINGS;**

**THENCE ALONG THE BOUNDARY LINE OF SAID "MOC DRIVEWAY" THE FOLLOWING SEVEN (7) COURSES;**

- 1. 82.30 FEET ALONG THE ARC OF NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 1260.00 FEET, A CENTRAL ANGLE OF 3°44'33", THE CHORD OF WHICH BEARS N58°16'03"E A DISTANCE OF 82.29 FEET TO A FOUND 5/8" REBAR AND 1.5" ALUMINUM CAP MARKED LS 36580;**
- 2. N63°26'47"E A DISTANCE OF 326.70 FEET;**
- 3. 50.91 FEET ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A RADIUS OF 67.50 FEET, A CENTRAL ANGLE OF 43°12'59", THE CHORD OF WHICH BEARS N41°50'17"E A DISTANCE OF 49.71 FEET;**
- 4. S70°03'24"E A DISTANCE OF 70.00 FEET;**
- 5. 45.65 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 19°01'29", THE CHORD OF WHICH BEARS S29°35'29"W A DISTANCE OF 45.44 FEET;**
- 6. 58.42' FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 24°20'50", THE CHORD OF WHICH BEARS S51°16'38"W A DISTANCE OF 57.98 FEET;**
- 7. S63°26'47"W A DISTANCE OF 283.44 FEET TO THE POINT OF BEGINNING.**

**LEGAL DESCRIPTION CREATED BY:**

**JOSHUA L. WILSON  
COLORADO PLS NO. 38417  
FOR, AND ON BEHALF OF SGM INC.**

As ☐ Joint Tenants ☐ Tenants in Common ☒ Other ENTITY

Whose mailing address is: **2307 WULFSHON ROAD, Glenwood Springs, CO 81601**

They have reviewed the **GENERAL WARRANTY DEED** and **Bill of Sale** dated July 8th, 2020 from **CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY** to **ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY** and by their signature hereto approve the deed and confirm that it correctly reflects the choice of tenancy, if applicable.

Date: **July 08, 2020**

**ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY**

By: *Dan Blankenship*  
**DAN BLANKENSHIP, CEO**



## Purchaser's Final Affidavit and Agreement

File No: 63014212

RE: Real property and improvements located at: **2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601**, in the County of **Garfield** State of Colorado, and more particularly described in the Commitment issued under the above Commitment No. **63014212** (the "Property").

**See attached "Exhibit A"**

The Purchaser (the "Purchaser") of the Property, hereby makes the following representations to Land Title Guarantee Company, and any title insurance company for which the Company is agent (collectively the "Company"), with full knowledge and intent that the Company shall rely thereon:

1. The Purchaser has not contracted with, or hired, any person or contractor to furnish services, labor or materials, including any person to furnish architectural or surveying work, for the construction, remodeling, renovations, repair or other maintenance, of improvements on the Property, within the last 120 days.
2. If any person or contractor, within the last 120 days, has furnished services, labor or materials, including any person who has furnished architectural or surveying work, for the construction, remodeling, renovations, repair or other maintenance of improvements on the Property, at the request or on behalf, of the Purchaser, such person or contractor has been paid in full. A complete description of such work or service with all payment information is attached.
3. The Purchaser has not entered into any contract or other agreement creating any right, interest or lien on the Property, or whereby the Property or any portion thereof has been leased. (If all or a portion of the Property is in possession of tenants, or under lease, attach a detailed rent roll with copies of the lease agreement(s)).
4. The Purchaser has taken, or will take, possession of the premises on **07/08/2020**.
5. The full purchase price has been paid by the Purchaser to Seller.

In light of the foregoing facts and representations, the Purchaser, in consideration of the issuance by the Company of a policy of Title Insurance covering Property, in the form set out in the Commitment, hereby promises, covenants and agrees to hold harmless, protect and indemnify the Company, from and against those liabilities, losses, damages, expenses and charges, including but not limited to reasonable attorneys' fees (including attorney's fees in the enforcement of this agreement) and expenses of litigation which the Company may incur, arising out of any inaccuracies in the above representations.

**ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY**

By: \_\_\_\_\_

**DAN BLANKENSHIP, CEO**



## Exhibit A

### PARCEL A:

LOT A (AMENDED), FIRST AMENDED MINOR SUBDIVISION PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER, IN THE CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO.

### PARCEL B:

THE ENTIRE PARCEL IDENTIFIED AS "MOC DRIVEWAY" IN THE SUBDIVISION PLAT OF GLENWOOD MEADOWS NO. 1, RECORDED AUGUST 9, 2004 AT RECEPTION NO. 657438 IN THE GARFIELD COUNTY CLERK AND RECORDERS OFFICE, ALSO LYING IN THE SW1/4 SECTION 5, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF GARFIELD, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN ANGLE POINT ON SAID "MOC DRIVEWAY", BEING A FOUND 5/8 REBAR AND 1.25" YELLOW PLASTIC CAP MARKED LS 38145 "V3", WHENCE THE COMMON SECTION CORNER FOR SECTIONS 5, 6, 7, AND 8 OF TOWNSHIP 6 SOUTH, RANGE 89 WEST, BEING A FOUND 2.5" ALUMINUM PIPE AND 3.25" ALUMINUM DOI/USBLM CAP PROPERLY MARKED AND DATED 1995 BEARS S69° 40' 34"W A DISTANCE OF 1079.31', ALSO BEING THE BASIS OF BEARINGS;

THENCE ALONG THE BOUNDARY LINE OF SAID "MOC DRIVEWAY" THE FOLLOWING SEVEN (7) COURSES;

1. 82.30 FEET ALONG THE ARC OF NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 1260.00 FEET, A CENTRAL ANGLE OF 3°44'33", THE CHORD OF WHICH BEARS N58°16'03"E A DISTANCE OF 82.29 FEET TO A FOUND 5/8" REBAR AND 1.5" ALUMINUM CAP MARKED LS 36580;
2. N63°26'47"E A DISTANCE OF 326.70 FEET;
3. 50.91 FEET ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A RADIUS OF 67.50 FEET, A CENTRAL ANGLE OF 43°12'59", THE CHORD OF WHICH BEARS N41°50'17"E A DISTANCE OF 49.71 FEET;
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7. S63°26'47"W A DISTANCE OF 283.44 FEET TO THE POINT OF BEGINNING.

LEGAL DESCRIPTION CREATED BY:  
JOSHUA L. WILSON  
COLORADO PLS NO. 38417  
FOR, AND ON BEHALF OF SGM INC.



**Owner's Final Affidavit and Agreement  
(Sale and Refinance)**

Commitment No: **63014212**

Escrow No. **63014212**

RE: Real property and improvements located at: **2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601**, in the County of **Garfield**, State of Colorado, more particularly described in the Commitment (the "Property")

**See attached "Exhibit B"**

The Owner, as Seller/Owner/Borrower (the "Owner") of the Property, hereby makes the representations set out in the attached Exhibit A to Land Title Guarantee Company, and any title insurance company for which the Company is agent for such title insurance company (collectively the "Company"), with full knowledge and intent that the Company shall rely thereon.

In light of the facts and representations made, the owner, in consideration of the issuance by the Company of a policy of Title Insurance covering the Property in the manner set out in the Commitment, hereby promises, covenants and agrees to hold harmless, protect and indemnify the Company, from and against those liabilities, losses, damages, expenses and charges, including but not limited to reasonable attorneys' fees (including attorney's fees in the enforcement of this agreement) and expenses of litigation which the Company may incur, arising out of any inaccuracies in the above representations.

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-  
RULE MUNICIPALITY**

*Jonathan Godes*

By: \_\_\_\_\_  
**Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM**



## Exhibit A to Owner's Affidavit and Agreement

### (A) General Representations of Owner as to liens, encumbrances, assessments, leases and tenancies

1. There has been no work of any kind, including architectural services, contracted for or otherwise ordered by the Owner, within the last 120 days, paid or unpaid, which could establish a priority for any future mechanics' lien claimant.
2. If any work has been done, those certain persons, firms and corporations, including the General Contractors, and all subcontractors hired by or under contract with the Owner who have furnished services, labor or materials, according to plans and specifications or otherwise, used in connection with the construction of improvements on the Property, have been paid in full. The Owner is required to attach a description of the work done with the corresponding payment information.
3. All improvements constructed on the Property were completed on or before **July 8th, 2020**.
4. No claims have been made against the Owner, nor is any suit now pending against the Owner, on behalf of any contractor, subcontractor; laborer or material man, nor any other suit of any kind, and that no chattel mortgage, conditional bills of sale, security agreements or financing statements have been made by the Owner.
5. Except as shown in the Commitment, there are no liens or encumbrances of any kind, recorded or unrecorded, affecting the Property.
6. All fees, assessments and charges of the homeowners association having jurisdiction over the Property, if applicable, are current at this time.
7. There are no existing leases, tenancies or possessory rights affecting the Property. (if all or a portion of the Property is in possession of tenants, or under lease, attach a detailed rent roll with copies of the lease agreement(s) or other documents evidencing the leases, tenancies or possessory rights).
8. If there are existing leases, tenancies or possessory rights, as listed in A7 above, none of the leases, tenancies or possessory rights contain an option to purchase, or a right of first refusal or similar type rights (if there are such rights, itemize each specific right and the document creating such rights at the end of this Exhibit A).
9. To the best of Owner's knowledge and belief, the Owner confirms that there have been no violations of any covenants, conditions or restrictions contained in any document shown in the Commitment, including but not limited to covenants, conditions or restrictions which may give rise to (i) a private charge or assessment; (ii) an option to purchase; (iii) a right of first refusal; (iv) a right of prior approval of a future purchaser or occupant, or (iv) any obligations of any type to perform maintenance, repair, or remediation on the Land.

### (B) Representations as to payoff of existing loans

1. To complete the transaction, certain loans, which have been made to the Owner and secured by promissory notes and deeds of trust against the Property (collectively the "Loans"), must be paid off and the Property released from the Loans.
2. The Company has obtained payoff amounts from the holders of the Loans (the "Payoff Amounts") and has relied on such Payoff Amounts to prepare the Owner's Statement of Settlement (the "Statement of Settlement").
3. The Owner represents to the Company that in the event the Payoff Amounts relied on by the Company were inaccurate or incorrect the Owner shall immediately undertake to repay the Company any and all overages the Owner received as result of such inaccuracy or error. The Owner hereby promises, covenants and agrees to hold harmless protect and indemnify the Company from and against those liabilities losses damages expenses and charges including but not limited to reasonable attorneys' fees incurred in the enforcement of this agreement and the expenses of litigation that the Company may incur arising out of any errors or inaccuracies in the Statement of Settlement.
4. The holders of the Loans have advised the Company that the Payoff Amounts are subject to final audit and that the payoff Amounts may change, with the result that additional funds may be demanded to ensure a final payoff and to secure the release of the Property from the Loans (the "Additional Funds").
5. Should any one or more of the holders of the Loans demand Additional Funds, the Owner, on request by the Company, undertakes to make immediate payment to the company of the Additional Funds.
6. In addition, if any one or more of the Loans provides for an open line of credit or a revolving line of credit, the Owner affirms that:
  - (a) The Owner has not drawn additional funds from the line of credit since the date of the payoff statement from the lender to the Company.
  - (b) If the Owner has made additional draws of the line of credit, the draws were made on \_\_\_\_\_ in the amount of \$\_\_\_\_\_.
  - (c) The Owner undertakes not to make any further draws on the open line of credit or a revolving line of credit after the date of this Payoff Indemnity and Agreement.
  - (d) The Owner has requested that the holders of the Loans close the open line of credit or revolving line of credit accounts.
7. The Owner has not taken out any loans against the Property other than those shown in the Commitment.

INITIALS: Seller(s): JG \_\_\_\_\_

## Exhibit B

### PARCEL A:

LOT A (AMENDED), FIRST AMENDED MINOR SUBDIVISION PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER, IN THE CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO.

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7. S63°26'47"W A DISTANCE OF 283.44 FEET TO THE POINT OF BEGINNING.

LEGAL DESCRIPTION CREATED BY:  
JOSHUA L. WILSON  
COLORADO PLS NO. 38417  
FOR, AND ON BEHALF OF SGM INC.

### GENERAL WARRANTY DEED

**THIS DEED** is dated July 8, 2020 and is made between CITY OF GLENWOOD SPRINGS, a Colorado Home-Rule Municipality, the "Grantor," and ROARING FORK TRANSPORTATION AUTHORITY, a Colorado Regional Transportation Authority a regional transportation authority and a political subdivision of the State of Colorado the "Grantee," whose legal address is 2307 Wulfsohn Road, Glenwood Springs, CO, 81601 County of Garfield and State of Colorado.

**WITNESS**, that the Grantor, for and in consideration of the sum of One Million Two Hundred Sixty Thousand and 00/100 DOLLARS, (\$1,260,000.00), the receipt and sufficiency of which is hereby acknowledged, hereby grants, bargains, sells, conveys and confirms unto the Grantee and the Grantee's heirs and assigns forever, all the real property, together with any improvements thereon, located in the County of Garfield and State of Colorado, described on **Exhibit A** attached hereto and incorporated herein by this reference.

also known by street address as: 2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601  
and assessor's schedule or parcel number:

**TOGETHER** with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, the reversions, remainders, rents, issues and profits thereof, and all the estate, right, title, interest, claim and demand whatsoever of the Grantor, either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances;

**TO HAVE AND TO HOLD** the said premises above bargained and described, with the appurtenances, unto the Grantee and the Grantee's heirs and assigns forever.

The Grantor, for itself and its successors and assigns, does covenant, grant, bargain, and agree to and with the Grantee, and the Grantee's heirs and assigns: that at the time of the ensealing and delivery of these presents, the Grantor is well seized of the premises above described; has good, sure, perfect, absolute and indefeasible estate of inheritance, in law and in fee simple; and has good right, full power and lawful authority to grant, bargain, sell and convey the same in manner and form as aforesaid; and that the same are free and clear from all former and other grants, bargains, sales, liens, taxes, assessments, encumbrances and restrictions of whatever kind or nature soever, except and subject to the following matters:

1. Permitted Exceptions as set forth on **Exhibit B** attached hereto and incorporated herein by this reference.
2. The easement reserved herein.

The Grantor hereby reserves a permanent, non-exclusive easement over, under, on, upon, through and across the property described as "Parcel B" in **Exhibit A** for purposes of ingress and egress to City of Glenwood Springs Waste Water Treatment Plant; above ground debris flow mitigation and surface water drainage systems; and the installation, repair, replacement and maintenance of underground utilities located in the easement as of the date of this reservation and utilities serving City-owned facilities. Grantor shall provide not less than thirty (30) days' notice to Grantee of any proposed construction activity within the

easement unless the construction activity is in response to an emergency and 30 days' notice is not possible. In that case, notice will be provided to the Grantee as soon as practicable. Grantor's use of the easement shall in no way hinder or prevent Grantee's proper and reasonable use and enjoyment of Parcel B, including Grantee's unencumbered rights to ingress and egress. Grantor hereby covenants to maintain the property affected by Grantor's exercise of the easement rights reserved herein, including the costs of mitigation, remediation, revegetation, and landscaping. In the exercise of easement rights hereby reserved, Grantor may, at its own expense and with reasonable prior notice to Grantee, relocate existing fences and other removable above-ground fixtures which interfere with the efficient use of the easement.

And the Grantor shall and will WARRANT THE TITLE AND DEFEND the above described premises, *but not any adjoining vacated street or alley, or other right-of-way that adjoins the real property*, if any, in the quiet and peaceable possession of the Grantee and the heirs and assigns of the Grantee, against all and every person or persons claiming the whole or any part thereof.

**IN WITNESS WHEREOF**, the Grantor has caused its corporate name to be hereunto subscribed by its president, vice-president, or other head officer, and its corporate seal to be affixed, attested by its secretary or other appropriate officer, on the date set forth above.

Signed this 8<sup>th</sup> day of July 2020.

CITY OF GLENWOOD SPRINGS,  
a Colorado Home-Rule Municipality

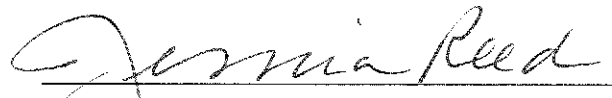
By:   
Jonathan Godes, Mayor

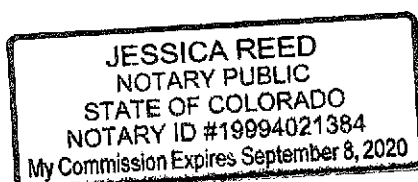
STATE OF COLORADO                    )  
                                                          ) ss.  
County of Garfield                    )

The foregoing instrument was acknowledged before me this 8<sup>th</sup> day of July 2020, by Jonathan Godes as Mayor of the City of Glenwood Springs, Grantor.

Witness my hand and official seal.

My commission expires: 9/8/2020

  
Notary Public



**EXHIBIT A  
LEGAL DESCRIPTION**

**PARCEL A:**

LOT A (AMENDED), FIRST AMENDED MINOR SUBDIVISION PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER, IN THE CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO.

**PARCEL B:**

THE ENTIRE PARCEL IDENTIFIED AS "MOC DRIVEWAY" IN THE SUBDIVISION PLAT OF GLENWOOD MEADOWS NO. 1, RECORDED AUGUST 9, 2004 AT RECEPTION NO. 657438 IN THE GARFIELD COUNTY CLERK AND RECORDERS OFFICE, ALSO LYING IN THE SW1/4 SECTION 5, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF GARFIELD, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN ANGLE POINT ON SAID "MOC DRIVEWAY", BEING A FOUND 5/8 REBAR AND 1.25" YELLOW PLASTIC CAP MARKED LS 38145 "V3", WHENCE THE COMMON SECTION CORNER FOR SECTIONS 5, 6, 7, AND 8 OF TOWNSHIP 6 SOUTH, RANGE 89 WEST, BEING A FOUND 2.5" ALUMINUM PIPE AND 3.25" ALUMINUM DOI/USBLM CAP PROPERLY MARKED AND DATED 1995 BEARS S69° 40' 34"W A DISTANCE OF 1079.31', ALSO BEING THE BASIS OF BEARINGS;

THENCE ALONG THE BOUNDARY LINE OF SAID "MOC DRIVEWAY" THE FOLLOWING SEVEN (7) COURSES;

1. 82.30 FEET ALONG THE ARC OF NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 1260.00 FEET, A CENTRAL ANGLE OF 3°44'33", THE CHORD OF WHICH BEARS N58°16'03"E A DISTANCE OF 82.29 FEET TO A FOUND 5/8" REBAR AND 1.5" ALUMINUM CAP MARKED LS 36580;
2. N63°26'47"E A DISTANCE OF 326.70 FEET;
3. 50.91 FEET ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A RADIUS OF 67.50 FEET, A CENTRAL ANGLE OF 43°12'59", THE CHORD OF WHICH BEARS N41°50'17"E A DISTANCE OF 49.71 FEET;
4. S70°03'24"E A DISTANCE OF 70.00 FEET;
5. 45.65 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 19°01'29", THE CHORD OF WHICH BEARS S29°35'29"W A DISTANCE OF 45.44 FEET;
6. 58.42' FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 24°20'50", THE CHORD OF WHICH BEARS S51°16'38"W A DISTANCE OF 57.98 FEET;
7. S63°26'47"W A DISTANCE OF 283.44 FEET TO THE POINT OF BEGINNING.

LEGAL DESCRIPTION CREATED BY:  
JOSHUA L. WILSON  
COLORADO PLS NO. 38417  
FOR, AND ON BEHALF OF SGM INC



**EXHIBIT B**  
**PERMITTED EXCEPTIONS**

1. EXISTING LEASES AND TENANCIES, IF ANY.
2. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED OCTOBER 26, 1896, IN BOOK 12 AT PAGE 440.
3. RIGHT OF WAY FOR DITCHES OR CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES AS RESERVED IN UNITED STATES PATENT RECORDED OCTOBER 26, 1896, IN BOOK 12 AT PAGE 440.
4. RIGHT OF PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES AS RESERVED IN UNITED STATES PATENT RECORDED SEPTEMBER 30, 1949, IN BOOK 245 AT PAGE 270.
5. EASEMENTS AS GRANTED TO PUBLIC SERVICE COMPANY OF COLORADO IN INSTRUMENTS RECORDED OCTOBER 17, 1966 IN BOOK 379 AT PAGE 400 AND RECORDED FEBRUARY 13, 1967 IN BOOK 382 AT PAGE 181.
6. TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN MUNICIPAL OPERATIONS FACILITY SITE ACQUISITION AGREEMENT, DATED DECEMBER 27, 1999 AND RECORDED July 8, 2020 AT RECEPTION NO. 938095 AND AS EVIDENCED BY DEED RECORDED FEBRUARY 01, 2000 IN BOOK 1171 AT PAGE 187.
7. TERMS, CONDITIONS AND PROVISIONS OF EASEMENT RECORDED FEBRUARY 01, 2000 IN BOOK 1171 AT PAGE 191.
8. ORDINANCE NO. 5, SERIES OF 2000, PROVIDING FOR ANNEXATION RECORDED MARCH 21, 2000 UNDER RECEPTION NO. 560886 AND CORRECTED BY INSTRUMENT RECORDED MAY 23, 2001 UNDER RECEPTION NO. 581407.
9. EASEMENTS ON THE PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER MINOR SUBDIVISION RECORDED NOVEMBER 07, 2002 UNDER RECEPTION NO. 614253.
10. EASEMENTS, CONDITIONS, COVENANTS, RESTRICTIONS, RESERVATIONS AND NOTES ON THE PLAT OF MINOR SUBDIVISION PLAT OF GLENWOOD MEADOWS NO. 1 RECORDED AUGUST 09, 2004 UNDER RECEPTION NO. 657438.
11. EASEMENTS, CONDITIONS, COVENANTS, RESTRICTIONS, RESERVATIONS AND NOTES ON THE PLAT OF FIRST AMENDED MINOR SUBDIVISION PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER RECORDED JUNE 25, 2020 UNDER RECEPTION NO. 937346.\

**MUNICIPAL OPERATIONS FACILITY  
SITE ACQUISITION AGREEMENT**

**THIS AGREEMENT** is made and entered into as of December 17, 1999, by and between GLENWOOD MEADOWS, LLC, a Colorado limited liability company (hereinafter "GM"), and the CITY OF GLENWOOD SPRINGS, a Colorado home-rule municipality (hereinafter "City");

WHEREAS, GM is the owner of certain property located in Garfield County, Colorado, commonly known as the Wulfsohn Ranch (hereinafter "Wulfsohn Ranch" or "Wulfsohn property"); and

WHEREAS, GM is the owner of various water rights decreed to the Atkinson Canal, the headgate for which is generally located as described in the decree entered September 7, 1976, in Case No. W-2910 (Water Division No. 5), which water rights, Atkinson Canal and existing lateral ditches are used to provide irrigation water to irrigated portions of the Wulfsohn Ranch ("Irrigated Acres"); and

WHEREAS, Prior hereto, GM conveyed certain lands generally located on the eastern portion of the Wulfsohn Ranch to the City for the City's development of a Community Center site (hereafter, the "Community Center Site") situate on both Irrigated Acres and certain non-Irrigated Acres; and

WHEREAS, the City now desires and intends to acquire approximately (but no less than) twenty-five (25) acres of non-Irrigated Lands located in the western portion of the Wulfsohn Ranch from GM for the purpose of developing a site which will satisfy the City's need to re-locate its existing municipal operations center (hereafter, the "MOC Site") in a configuration and generally as described by Exhibit A attached hereto and by this reference incorporated herein; and

WHEREAS, the City and GM have agreed that GM shall accept, as consideration for conveyance of the MOC Site to the City, a credit against future water and sewer system improvement fees (hereafter, the "Fee Credits"); and

WHEREAS, the City and GM have (i) agreed upon the values to be attributed to the land comprising the MOC Site and the Fee Credits, and (ii) engaged in negotiations concerning the City's intended acquisition, location and future uses of the MOC Site land on the Wulfsohn; and

WHEREAS, GM has agreed, as additional consideration for the Fee Credits and other benefits provided to GM hereunder, to convey to the City, by boundary adjustment or other legal process acceptable to both parties hereto, approximately one (1) acre of land contiguous to and directly west of the western boundary of the Community Center property for the purpose of the City's construction of an access road to and from the Midland Avenue Alternate Route and said Community Center; the precise dimensions of which conveyance shall be established by survey acceptable to both parties within thirty (30) days of the date hereof; and

WHEREAS, on December 2, 1999 the City Council of the City of Glenwood Springs, Colorado did determine that the City shall enter into this Agreement for the purposes of acquiring the MOC Site; and

WHEREAS, the City and GM agree to cooperate with and join in the subdivision, surveying, utility extension and other efforts with respect to said property comprising the MOC Site; and

WHEREAS, the parties desire to set forth herein their agreement concerning the conveyance (i) from GM to the City of that portion of the Wulfsohn Ranch required for the MOC Site, (ii) from the City to GM of the Fee Credits, and (iii) related matters.

**NOW, THEREFORE**, for and in consideration of the above recitals, the mutual covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, GM and the City agree as follows:

1. Conveyance of MOC Site Property. Upon closing of these premises at a mutually agreeable date and time between the date hereof and March 1, 2000 (subject to the provisions of Article 5 hereinbelow), at the offices of Land Title Guarantee Company located at 817 Colorado Avenue, Glenwood Springs, Colorado, the following shall occur:

A. GM shall convey by Special Warranty Deed to the City with a surveyed legal description reflecting that portion of the Wulfsohn Ranch described upon Exhibit A as annexed hereto. Said conveyance does not include any water or water rights which are presently owned by GM. Said conveyance shall be subject to all matters of public record affecting the subject property as well as the following additional matters:

(i) GM shall reserve from the conveyance to the City a debris flow drainage easement, for the benefit of GM and the City, for the sole and exclusive purpose of directing and mitigating debris flows from other portions of the Wulfsohn Ranch; the precise location and dimensions of which debris flow drainage easement to be determined at a later date and subject to the approval of the City, which approval shall not be unreasonably withheld.

2. Transfer of Fee Credits. The City shall convey by Bill of Sale or other appropriate instrument, acceptable to GM, the Fee Credits. The parties hereby agree that such Fee Credits do not include the costs of water and sewer line extension to GM's property or in any manner affect GM's obligations to pay a prorated share of the line extension costs incurred by the City under applicable cost recovery programs. The Fee Credit transfer shall consist of One hundred thirty-five (135) City water system improvement fee credits and One hundred thirty-five City sewer system improvement fee credits (the total value of the 135 water and sewer system improvement fee credits is deemed to represent \$723,651.00 based upon the City's anticipated Year 2000 charges - See attached Schedule of Fees set forth on Exhibit B hereto). The conveyance of the Fee Credits shall inherently permit GM to access the City's sewer and water systems, regardless of the status of annexation of the remainder of the Wulfsohn property. In no event shall GM be permitted to exercise any of the rights represented by the Fee Credits to serve development of property with an elevation in excess of 6,000 feet. GM may, upon reasonable prior written notice to City, exercise its right to access the City's sewer and water system for purposes of utilizing the Fee Credits at any time following the closing of the conveyance of the MOC Site to the City; provided, however, that in the event the City has not, prior to receipt of GM's written notice of intent to exercise, extended the existing water and sewer service lines to serve the needs of the MOC

Site, the City shall not be obligated to extend the existing water and sewer service lines upon receipt of such written notice from GM. Any extension of the City's water and sewer service lines required by GM to exercise the Fee Credits described hereunder shall be at the sole cost and expense of GM, whereupon GM shall be entitled to proportionate cost recovery and recapture rights from the City or future third party developers who may access the extended service lines.

3. Utility Easement. Upon the closing of the transactions set forth herein, GM shall deliver to the City a fully executed non-exclusive easement across GM's property for the purposes of permitting the City to extend its water, sewer, electric, gas, telephone and any other applicable utility lines from the existing terminus of said lines at or near the Community Center Property to the City's MOC Site. Said easement shall be adjacent to the City's Midland Avenue Alternate Route right-of-way. The easement shall be thirty (30) feet in width. GM and the City agree that the City shall not utilize the easement for permanent above-ground utilities, except that the City may, with the approval of GM, which approval shall not be unreasonably withheld, locate such above ground structures which are a necessary adjunct to the utility services within the easement (such as transformer stations and lift or pump stations). GM shall reserve from the easement right to use such easement for legal and physical access of vehicles, pedestrians and utilities to and from its Wulfsohn property and the Midland Avenue Alternate Route. GM shall also have the right to create multiple surface uses within said utility easement, including detention structures, signage and landscaping in a manner which does not unreasonably interfere with the City's utility uses. In consideration for the granting of the utility easement by GM, the City hereby agrees that if and when service lines are developed, such lines shall be sufficient to satisfy future development needs of the Wulfsohn property under current Master Land Use Plan designated uses.

4. Costs. Each party shall pay an equal amount of (i) the costs of obtaining a survey of the MOC Site and (ii) any closing costs associated with the transactions contemplated hereby.

Each party hereto shall pay all costs of recording such instruments received by that party, including any deeds or grants of easement, and each party hereto shall pay an equal amount of the costs of recording other closing documents required by this Agreement, including any covenants, and shall undertake all other reasonable steps necessary to effectuate the intent of this Agreement, specifically including, but without limitation whatsoever, (i) the recordation of any plats required as a result of the subdivision of the MOC Site from the remainder of the Wulfsohn ranch as may be required by subdivision regulations of Garfield County, Colorado, and (ii) the filing of appropriate maps and other documents with the Garfield County Assessor's office.

With respect to the lands conveyed by GM to the City, GM shall pay the premium for and deliver to the City, within ten (10) days of the execution hereof, a commitment for title insurance and copies of any instruments listed as exceptions to title insurance coverage. Within a reasonable time after closing, GM shall pay the costs of and deliver to the City an ALTA Form of title insurance policy based upon the aforementioned previously issued title insurance commitment. The amount of title insurance shall be in an amount equal to the valuation of the Fee Credits set forth by Article 2, hereinabove.

Real property taxes shall be prorated to the day of closing based upon the most recent

mill levy and most recent assessment and shall be determined by the ratio the MOC Site property bears to the Wulfsohn Ranch as a whole (not including the property comprising the Community Center site).

5. Land Use Contingency. This Agreement is expressly contingent upon the legal subdivision of the MOC Site from the remainder of the Wulfsohn Ranch owned by GM. The City hereby agrees to undertake the application and prosecution of such process as shall be necessary to effectuate the legal subdivision of the MOC Site through Garfield County, Colorado. GM agrees that it shall fully cooperate with the City in the necessary execution of applications and related matters with regard to such subdivision. In the event the City is unable to secure a subdivision of the MOC Site from the remainder of the Wulfsohn property on or before March 1, 2000, the parties shall either (i) extend the closing date for these transaction for a reasonable time not to exceed three months in order that the City may continue its prosecution of the subject application, and/or (ii) enter negotiations regarding the size and configuration of the MOC Site in an effort to permit the legal conveyance of the same to the City.

6. Non-Interference with Agricultural Operations. The City agrees, for itself and its agents, employees, contractors, subcontractors and material suppliers, to (A) keep construction activity for the MOC Site project within the MOC Site and utility easement; and (B) ensure that GM, its tenants and lessees will have access to the Wulfsohn Ranch during work on the MOC Site.

7. Fencing. To the extent possible, the parties hereto agree to maintain such existing fencing between the MOC Site, the utility easement and the remainder of the Wulfsohn Ranch. Prior to commencement of any work on the MOC Site, the City shall take all steps reasonably necessary to secure the MOC Site property from either (i) the agricultural activities of the adjacent remainder of the Wulfsohn Ranch and/or (ii) GM's development activities on the remainder of the Wulfsohn Ranch. After completion of the MOC Site, the City at its expense shall maintain, repair and replace all fencing along the boundary between the Community Center Property and the Wulfsohn Ranch, unless damage is caused by ranching operations of GM, its tenants or lessees on the Wulfsohn Ranch.

8. Midland Extension Access Points.

A. Existing GM Access Rights. The City has provided to GM (through that certain Midland Avenue Right of Way Extension Acquisition Agreement dated September 20, 1994) three access points for use by GM in connection with its farming and ranching and future development operations on the Wulfsohn Ranch. The City has also granted GM the right to use the Community Center access point in the event of future development of GM's property. The City agrees that none of GM's present access point rights are to be considered as used for the City's access to the MOC Site. For these purposes, the City shall install one (1) new access point within the boundary of the MOC Site.

B. Development Access Points. The City agrees to continue to provide to GM three future access points (and the right to use the

Community Center access point) from the Midland Extension Right-of-Way onto the Wulfsohn Ranch property at such time as GM desires to develop the Wulfsohn Ranch property. One access point shall be for the north outparcel created on the west end of the Wulfsohn Ranch as a result of the Midland Extension Project. Two access points shall be for the developable portions of the Wulfsohn Ranch property located south of the Midland Extension Right-of-Way Parcel and East of the MOC Site. The actual location and design of such access points shall be subject to engineering considerations and approval of the City, which approval shall not be unreasonably withheld. Such accesses shall be constructed to agreed upon specifications at GM's sole expense; provided, however, the City shall not, as a condition of granting such accesses, require GM to pay the City any consideration whatsoever. This Agreement is not intended to alter or otherwise affect the existing agreements between the parties hereto with respect to these matters.

C. MOC Site Access Point and Road. The City agrees that GM shall have the right to utilize the road to be developed as part of the MOC Site development project and that GM may incorporate such road in its development plans for the remainder of the Wulfsohn Ranch; provided, however, that in the event of such use by GM, GM shall be obligated to reimburse the City for the initial road costs based upon the then estimated proportionate use of such road by GM or its assigns.

9. Indemnity. To the extent permitted by law, and limited in duration to applicable statutes of limitation, the parties shall indemnify and hold each other free and harmless from and against any and all liabilities, suits, claims, actions, proceedings, judgments, decrees, settlements, demands, and causes of action of all kinds, including but not limited to claims of damages to or losses of property of the City, GM or others for injury, illness, or death, attorneys' fees and costs which arise from or in any manner relate to:

- A. GM's prior ownership of the MOC Site or the City's present ownership of the MOC Site;
- B. Work performed, facilities installed, or materials provided by either party, their contractors, subcontractors, materialmen, or others in connection with past or future work on or development of the MOC Site, the Wulfsohn property and the respective appurtenant facilities of each.
- C. Damages of any type claimed by any landowner, tenant, or other person located downstream or downgradient of the MOC Site or the remainder of the Wulfsohn property which arise from or relate to work on or development of the same

10. Amendment. Any modification or amendment hereto shall be evidenced by a



writing signed by the parties.

11. Binding Effect; Survival. This Agreement shall be binding upon and inure to the benefit of the parties, their successors, grantees, and assigns. Each term and condition of this Agreement shall survive the closing on the MOC Site property.

12. Authority. Each person executing this Agreement represents and warrants that he has been duly authorized by the party that he purports to represent to execute this Agreement, and has authority to bind said party to the terms and conditions of this Agreement.

13. Governing Law. This Agreement shall be construed under the laws of the State of Colorado.

14. No Waiver. No provision of this Agreement may be waived except by an agreement in writing signed by the waiving party. A waiver of any term or provision shall not be construed as a waiver of any other term or provision.

15. Headings. The paragraph headings in this Agreement shall not be used in the construction or interpretation hereof, as they have no substantive effect and are for convenience only.

16. Severability. If any part or section of this Agreement shall be found void or invalid by court of competent jurisdiction, such finding shall not affect any remaining part or section, and said remaining parts or sections shall continue in full force and effect. The parties shall renegotiate in good faith any matter addressed by a part or section that is found void or invalid.

17. Notice. All notices required under this Agreement shall be in writing and shall be hand delivered, sent by facsimile or sent by registered or certified mail, return receipt requested, postage prepaid, to the addresses of the parties herein set forth. All notices so given shall be considered effective seventy-two (72) hours after deposit postage paid in the United States Mail with the proper address as set forth below. Either party by notice so given may change the address to which future notices shall be sent.

Notice to: Glenwood Meadows, LLC  
c/o Robert Macgregor  
525 East Cooper Avenue  
Aspen, CO 81611  
(970) 925-9046 Telephone  
(970) 925-9076 Facsimile

With copy to: Thomas J. Hartert  
802 Grand Avenue, Suite 303  
Glenwood Springs, CO 81601  
(970) 928-7803 Telephone  
(970) 928-7805 Facsimile

Notice to:

City of Glenwood Springs

attn: City Manager

attn: City Attorney

806 Cooper Avenue

Glenwood Springs, CO 81601

(970) 945-2575 Telephone

(970) 945-2597 Facsimile

18. Signatures: Counterparts. GM and the City agree that signatures obtained by facsimile transmission shall be sufficient and binding for purposes of this Agreement, and that original signatures shall be forwarded to each party. This Agreement may be executed in multiple original counterparts, each of which shall constitute an original but all of which shall constitute one and the same document.

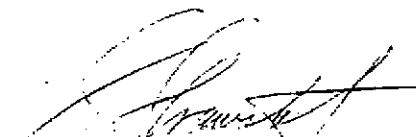
**IN WITNESS WHEREOF**, the parties have executed this Agreement in duplicate originals on the day and year first written above.

**CITY OF GLENWOOD SPRINGS**

**GLENWOOD MEADOWS, LLC,**

a Colorado Limited Liability Company

By: Dunrene Management, Inc., its Manager

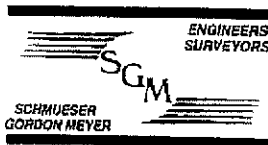
By: 

Name: Sam Skramstead, Mayor

By: 

Name: Robert Duncan Macgregor

Title: President of Dunrene

118 West 6th, Suite 200  
Glenwood Springs, CO 81601

December 30, 1999

Job # 97097 B

**LEGAL DESCRIPTION - EXEMPTION PARCEL**

A tract of land situate in the NE 1/4 of Section 8 and the NW 1/4 of Section 9, all in Township 6 South, Range 89 West of the 6th Principal Meridian being more particularly described as follows:

Beginning at a point whence the southeast corner of the SW 1/4 of the NW 1/4 of said Section 9 bears S 59°45'07" E 2360.09 feet; thence N 62°49'19" E 281.27 feet; thence N 27°10'41" W 147.90 feet; thence 323.70 feet on the arc of a curve to the left, having a radius of 760.00 feet, a central angle of 24°24'13", and subtending a chord bearing N 75°01'26" E 321.26 feet; thence N 62°49'19" E 292.63 feet to the westerly right of way line of Midland Avenue; thence along the westerly right of way line of Midland Avenue the following courses:

- 1) S 21°43'32" E 150.12 feet; thence
- 2) 272.23 feet along the arc of a curve to the left, having a radius of 1185.00 feet, a central angle of 13°23'19", and subtending a chord bearing S 28°25'10" E 271.61 feet; thence
- 3) S 35°06'49" E 21.42 feet; thence
- 4) S 54°53'11" W 22.69 feet; thence
- 5) S 41°40'06" E 43.30 feet; thence
- 6) N 54°53'11" E 17.75 feet; thence
- 7) S 30°38'49" E 271.57 feet; thence
- 8) S 41°04'38" E 291.31 feet; thence
- 9) S 23°28'47" E 143.44 feet; thence
- 10) 95.89 feet along the arc of a curve to the left, having a radius of 100.00 feet, a central angle of 54°56'35", and subtending a chord bearing S 50°57'06" E 92.26 feet;

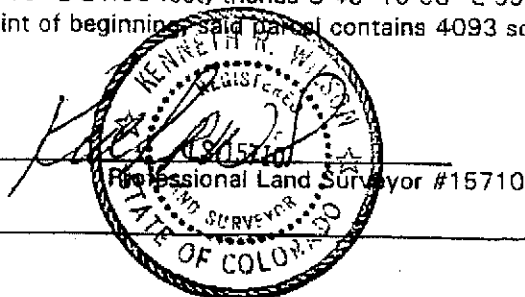
thence leaving said right-of-way line on a course bearing S 17°34'08" W 81.64 feet; thence S 12°15'32" E 109.78 feet; thence S 19°54'08" E 208.92 feet; thence S 50°07'49" E 109.72 feet; thence S 33°57'41" E 159.48 feet to the south line of the NW 1/4 of said Section 9 whence the southeast corner of the SW 1/4 of the NW 1/4 of said Section 9 bears S 88°48'57" E 361.88 feet; thence N 88°48'57" W 956.62 feet along the south line of said SW 1/4 of the NW 1/4 of Section 9; thence N 89°15'16" W 378.91 feet along the south line of the SE 1/4 of the NE 1/4 of said Section 8; thence N 16°27'24" W 1206.11 feet to the point of beginning, containing 37.281 acres more or less.

**LEGAL DESCRIPTION - UTILITY EASEMENT**

A utility easement situate in the NW 1/4 of Section 9, Township 6 South, Range 89 West of the 6th Principal Meridian being more particularly described as follows:

Beginning at a point whence the southeast corner of the SW 1/4 of the NW 1/4 of said Section 9 bears S 43°00'33" E 1567.73 feet; thence N 48°52'27" W 89.30 feet; thence N 49°57'33" E 51.61 feet; thence S 49°31'10" E 24.96 feet; thence S 40°10'58" E 55.42 feet; thence S 38°56'33" W 42.93 feet to the point of beginning, said parcel contains 4093 square feet more or less.

Date

*3 Jan 2000*

(TD-1000)  
Confidential Document

This form provides essential market information to the county assessor to ensure accurate, fair and uniform assessments for all property. This document is not recorded, is kept confidential, and is not available for public inspection.

**This declaration must be completed and signed by either the grantor (seller) or grantee (buyer).** Questions 1, 2, 3, and 4 may be completed (prefilled) by a third party, such as a title company or closing agent, familiar with details of the transaction. The signatory should confirm accuracy before signing.

This form is required when conveyance documents are presented for recording. If this form is not completed and submitted, the county assessor may send notice. If the completed and signed form is not returned to the assessor within 30 days of notice, the assessor may impose a penalty of \$25.00 or 0.025% (0.00025) of the sale price, whichever is greater.

Additional information as to the purpose, requirements, and level of confidentiality regarding this form are outlined in Colorado Revised Statutes, sections 39-14-102, 39-5-121.5, and 39-13-102.

1. Address and/or legal description of the real property sold: Please do not use P.O. Box numbers  
**2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601**

2. Type of Property purchased: ☐ Single Family Residential ☐ Townhome ☐ Condominium ☐ Multi-Unit Res ☒ Commercial  
☐ Industrial ☐ Agricultural ☐ Mixed Use ☐ Vacant Land ☐ Other \_\_\_\_\_

3. Date of Closing: **July 08, 2020**

Date of Contract if different than date of closing: **February 01, 2020**

4. Total sale price: Including all real and personal property. **\$1,260,000.00**  
Contracted price (if different from final sale price) **\$1,260,000.00**

5. List any personal property included in the transaction that materially impacts the total sale price. Personal property may include, but is not limited to: machinery or equipment, vehicles, exceptional appliances, electronic devices, furniture, or anything that would not typically transfer with the real property (attach additional pages if necessary).

| Description              | Approximate Value |
|--------------------------|-------------------|
| <u>None</u>              | \$ _____          |
| _____                    | \$ _____          |
| _____                    | \$ _____          |
| _____                    | \$ _____          |
| Personal Property Total: | \$ _____          |

If no personal property is listed, the entire purchase price will be assumed to be for the real property.

6. Did the total sales price include a trade or exchange of additional real or personal property? ☐ Yes ☒ No

If yes, give the approximate value of the goods or services as of the date of closing. \$ \_\_\_\_\_

If yes, does this transaction involve a trade under IRS Code Section 1031? ☐ Yes ☒ No

7. Was 100% interest in the real property purchased? Mark "no" if only a partial interest is being purchased.

☒ Yes ☐ No If no, interest purchased: \_\_\_\_\_ %

8. Is this a transaction between related parties or acquaintances? This includes persons connected by blood or marriage, or business affiliates, or those acquainted prior to the transaction. ☐ Yes ☒ No

9. Please mark type of sale: ☐ Builder (new construction) ☐ Public (MLS or Broker Representation)

☒ Private (For Sale By Owner) ☐ Other (describe) \_\_\_\_\_

10. Check any of the following that apply to the condition of the improvements at the time of purchase:

☐ New ☐ Excellent ☐ Good ☐ Average ☐ Fair ☐ Poor ☒ Salvage



If the property is financed, please complete the following:

11. Type of financing: (Check all that apply)

- ☒ None (all cash or cash equivalent)  
☐ New/Mortgage Lender (government-backed or conventional bank loan)  
☐ New/Private Third Party (nonconventional lender, e.g., relative, friend, or acquaintance)  
☐ Seller (buyer obtained a mortgage directly from the seller)  
☐ Assumed (buyer assumed an existing mortgage)  
☐ Combination or Other: Please explain \_\_\_\_\_

12. Total amount financed: \_\_\_\_\_

13. Terms:

- Variable Starting interest rate % \_\_\_\_\_  
☐ Fixed Interest rate % \_\_\_\_\_  
Length of time years \_\_\_\_\_  
Balloon Payment ☐ Yes ☐ No If yes, amount \$0.00 Due Date \_\_\_\_\_

14. Mark any that apply:

- ☐ Seller assisted down payment  
☐ Seller concessions  
☐ Special terms of financing

If marked, please specify: \_\_\_\_\_

15. Was an independent appraisal obtained in conjunction with this transaction? ☐ Yes ☒ No

For properties other than residential (Residential is defined as: single family detached, townhomes, apartments, and condominiums) please complete questions 16-18 if applicable. Otherwise, skip to #19 to complete.

16. Did the purchase price include a franchise or license fee? ☐ Yes ☐ No

If yes, franchise or license fee value? \_\_\_\_\_

17. Did the purchase price involve an installment land contract? ☐ Yes ☐ No

If yes, date of contract: \_\_\_\_\_

18. If this was a vacant land sale, was an on-site inspection of the property conducted by the buyer prior to the closing? ☐ Yes ☐ No

Remarks: Please include any additional information concerning the sale you may feel is important.

19. Signed on this day of

July 08, 2020

Have at least one of the parties to the transaction sign the document, and include an address and a daytime phone number.

Signature of ☒ Grantee(Buyer) ☐ or Grantor(Seller)

**ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY**

By: \_\_\_\_\_

DAN BLANKENSHIP, CEO

20. All future correspondence (tax bills, property valuations, etc.) regarding this property should be mailed to:

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

**2307 WULFSHON ROAD, Glenwood Springs, CO 81601**

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Contact information is kept confidential, for County Assessor and Treasurer use only, to contact buyer with questions regarding this form, property valuation, or property tax information.

## Escrow Agreement

Date: **July 08, 2020**

Escrow Number: **63014212**

Closer: **Jessica Reed**

The undersigned deposit with Land Title Guarantee Company, a Colorado Corporation, as Escrow Holder (the "Escrow Holder"), the items set forth in Schedule A, to be held by Escrow Holder subject to the terms of this Escrow Agreement, the General Provisions to the Escrow Agreement and the Special Instructions in Schedule B (collectively, the "Escrow Agreement").

"Schedule A"  
(Deposits)

**50,000.00 From CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

"Schedule B"  
(Special Instructions)

- ☒ Special Instruction No. 1 (Repairs) Attached
- ☐ Special Instruction No. 1A (Completion) Attached
- ☐ Special Instruction No. 2 (Lender Completion Instructions) Attached
- ☐ Special Instruction No. 3 (Indemnity Agreement – Cash Deposit) Attached
- ☐ Special Instruction No. 4 (Depository Instructions) Attached
- ☐ Special Instruction No. 5 (F.I.R.P.T.A)
- ☐ Special Instruction No. 6A (Resolution of Miscellaneous Issues)
- ☐ Special Instruction No. 6B (Dissolution of Marriage)
- ☐ Special Instruction No. 6C (Post-Closing Occupancy Agreement)
- ☐ Special Instruction No. 6D (Pending Court Action)
- ☐ All others (See attached Exhibit "A")

The parties to the Escrow Agreement, by their signature below, acknowledge and agree that they have read, and will be bound by the Escrow Agreement, including the General Provisions to the Escrow Agreement, and the Special Instructions in Schedule B.

**Seller(s)**  
(if applicable)

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

By: \_\_\_\_\_

**Jonathan Godes, Mayor**

**Buyer/Borrower(s)**  
(if applicable)

**ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY**

By: \_\_\_\_\_

**DAN BLANKENSHIP, CEO**





Address: **101 W. 8TH STREET**

**Glenwood Springs, CO 81601**

Phone #: **(970) 945-2261**

Fax #:

Email: **asi@mountainlawfirm.com**

Contact: **ANNA ITENBERG**

**Lender: N/A**

(If applicable)

By:

Address: **N/A**

**N/A**

Phone #: **N/A**

#:

Contact: **N/A**

Any correspondence regarding this escrow shall be addressed to:

**Land Title Guarantee Company**

**5975 Greenwood Plaza Blvd.**

**Greenwood Village, Colorado 80111**

**Attn: Escrow Coordinator**

**Phone: 303-321-1880**

**Fax: 303-399-8193**

**Email: disb@ltgc.com**

Address: **2307 WULFSON ROAD**

**Glenwood Springs, CO 81601**

Phone #: **(970) 925-9190**

Fax #:

Email: **taddune@compuserve.com**

Contact: **PAUL TADDUNE**

Escrow Fees to be as Follows:

(a) Set up Fee: **50.00**

(b) Miscellaneous: **0.00**

**N/A**

Note: After the issuance of four (4) checks, a fee of \$10.00 per

check will be made for each additional check.

Receipt of the Escrow Deposit and acceptance of the Escrow

Agreement hereby acknowledged by:

Land Title Guarantee Company - Escrow Holder

*Jessica Reed*

**Jessica Reed**

**Land Title Guarantee Company**  
**General Provisions to the Escrow Agreement**

**1. Notices.**

Any notices required or permitted to be given under the Escrow Agreement shall have been deemed to have been served:

- i. one business day after the notice is hand delivered with proof of receipt by the addressee, or
- ii. one business day after transmission by facsimile evidencing confirmation of receipt by the receiving facsimile machine, or
- iii. one business day after transmission by email evidencing confirmation of receipt by the receiving email address, or
- iv. if reputable overnight courier (such as United Parcel Service or Federal Express) is used, on the immediately following business day after notice is sent for overnight delivery, or
- v. if the United States Mail is used, on the third business day after the notice is deposited in the United States Mail, postage prepaid;

Provided in each case such notice is addressed to the parties at the addresses given on the first page of this Escrow Agreement.

**2. Reliance on Notice.**

Escrow Holder may act in reliance upon any writing or instrument or signature which Escrow Holder, in good faith, believes to be genuine, and may assume the validity and accuracy of any statement or assertion contained in such a writing or instrument, and may assume that any person purporting to give any writing, notice, advice or instruction in connection with the provisions hereof has been duly authorized so to do.

**3. Laws Relating to Unclaimed Funds.**

Seller and Buyer are hereby advised that unclaimed funds may be payable to the State at some future date pursuant to unclaimed property laws, and should Escrow Holder pay any such funds held in the Escrow Deposit, Escrow Holder shall be released from all further responsibility under the Escrow Agreement and shall not be liable to any Party so long as such payment was made pursuant to applicable law.

**4. Escrow Deposit and Interest Earned on Escrow Deposit.**

- a. Upon receipt of written direction of the parties along with a completed W-9 any money comprising the Escrow Deposit will be invested in an interest bearing account.
- b. Deposits of \$100,000.00 or more may be directed by the parties hereto to other types of investments, or the Escrow Holder may invest the Escrow Deposit in Repurchase Agreements for U.S. Treasury obligations or other Federal agency issued securities.
- c. Escrow Holder shall not be responsible for maximizing the yield on the Escrow Deposit. Under no circumstances shall Escrow Holder be liable for loss of funds due to bank or other Institution failure, including employees or agents thereof, suspension or cessation of business, or any action or inaction on the part of the bank or other institution, or any delivery service transporting funds to and from the institution.
- d. All parties hereto shall execute and deliver to Escrow Holder all forms required by federal, state or other governmental agencies relative to taxation matters and Escrow Holder will file appropriate 1099 or other required forms.

**5. Fees and Expenses of Escrow Holder.**

- a. The Escrow Holder shall be entitled to reimbursement in full, or may demand payment in advance, for all costs, expenses, charges, fees or other payments made or to be made by Escrow Holder in the performance of Escrow Holder's duties and obligations under the Escrow Agreement.
- b. The parties to the Escrow Agreement are jointly and severally liable for the payment to Escrow Holder of all fees and expenses. Escrow Holder is hereby authorized and directed to reimburse to itself in payment of fees or expenses from any funds in the Escrow Deposit, whether from principal or interest or both, at any time, and from time to time, as the same may be due and owing.
- c. Escrow Holder is hereby authorized to withhold any fees or expenses from any disbursement or distribution of Escrow Deposit to any Party hereto or to the Clerk of the Court upon interpleader.
- d. In the event that the Escrow Deposit shall consist of documents only and not funds, Escrow Holder may refuse to distribute any such documents or to otherwise act under this Agreement until all accrued but unpaid fees and expenses have been paid in full.

**6. Non-liability of Escrow Holder.**

- a. Escrow Holder shall not be liable for any mistakes of fact, or errors of judgment or for any acts or omissions of any kind unless caused by the willful misconduct or gross negligence of Escrow Holder.
- b. Escrow Holder shall not be liable for any taxes, assessments or other governmental charges which may be levied or assessed upon the Escrow Deposit or any part thereof, or upon the income therefrom.
- c. Escrow Holder may rely upon the advice of counsel and upon statements of accountants, brokers or other persons reasonably believed by it in good faith to be expert in the matters upon which they are consulted, and for any reasonable action taken or suffered in good faith based upon such advice or statements.

**7. Indemnity of Escrow Holder.**

The Seller and Buyer jointly and severally, agree to:

- i. indemnify Escrow Holder for, and hold it harmless against any and all liability incurred by the Escrow Holder by reason of this Escrow Agreement, or in connection with Escrow Agent's performance of its duties hereunder, except for Escrow Holder's own willful misconduct or gross negligence, and
- ii. reimburse Escrow Holder for all its expenses, including, but not necessarily limited to, attorneys' fees and court costs incurred pursuant to this Escrow Agreement.

**8. Request for Written Instructions.**

- a. Escrow Holder may at any time, and from time to time, request the Seller and Buyer to provide written instructions concerning the propriety of a proposed payment of the Escrow Deposit, distribution of documents, or other action or refusal to act by Escrow Holder.
- b. Should the Seller and Buyer fail to provide such written instructions within a reasonable time, Escrow Holder may take such action, or refuse to act, as it may deem appropriate and shall not be liable to anyone for such action or refusal to act.
- c. Notwithstanding the foregoing, should the terms of the Escrow Agreement be complied with, in the judgment of Escrow Holder, then the Escrow Holder may disburse any funds, distribute documents, or take such action without specific further written instructions from any Party.

**9. Disputes and Interpleader.**

- a. In the event of any dispute between the Parties as to either law or fact, or in the event any of the parties hereto fail, for any reason, to fully receipt and acquit the Escrow Holder in writing, Escrow Holder may refuse, in its discretion, to carry out said escrow instructions or to deliver any funds, documents, or property in its hand to anyone and in so doing shall not become liable to demand.
- b. Escrow Holder shall be entitled to continue, without liability, to refrain and refuse to act:
  - i. until all the rights of the adverse claimants have been finally adjudicated by a court having jurisdiction over the Parties and the items affected hereby, after which time the Escrow Holder shall be entitled to act in conformity with such adjudication; or
  - ii. until all differences shall have been adjusted by agreement and Escrow Holder shall have been notified thereof and shall have been directed in writing signed jointly or in counterpart by the parties and all persons making adverse claims or demand, at which time Escrow Holder shall be protected in acting in compliance therewith.
- c. Escrow Holder also has the right to interplead into a court of competent jurisdiction at the expense of the Parties.

**10. Resignation of Escrow Holder.**

- a. Escrow Holder may resign under this Agreement by giving written notice to all of the parties hereto, effective 30 days after the date of said notice.
- b. Upon the appointment by the parties of a new escrow holder or custodian, or upon written instructions to Escrow Holder for other disposition of the Escrow Deposit, Escrow Holder shall, after retention of its accrued escrow fees and expenses, if any, shall deliver the Escrow Deposit within a reasonable period of time as so directed, and shall be relieved of any and all liability hereunder arising thereafter.

**11. Applicable Law.**

This Agreement shall be governed by the laws of the State of Colorado.

**12. Counterparts/Third Party Beneficiaries.**

This Escrow Agreement may be executed in any number of counterparts, each of which when so executed shall constitute the entire agreement between the Seller and Buyer. The Seller and Buyer acknowledge and agree that there are not intended or unintended third party beneficiaries who may rely upon or benefit from the provisions of this agreement.

**13. Electronic Signatures and Notices.**

The execution of this Escrow Agreement, and any other notice required or permitted under this Escrow Agreement, may be given and transmitted by electronic means (including email, facsimile, or similar transmission) and shall be deemed effective for all purposes. Documents with original signatures are not required. If original signatures are required by any party, this request must be made prior to execution of this Escrow Agreement or any other notice, to ensure compliance with the request.

## Escrow Agreement

Date: **July 08, 2020**

Escrow Number: **63014212**

Closer: **Jessica Reed**

The undersigned deposit with Land Title Guarantee Company, a Colorado Corporation, as Escrow Holder (the "Escrow Holder"), the items set forth in Schedule A, to be held by Escrow Holder subject to the terms of this Escrow Agreement, the General Provisions to the Escrow Agreement and the Special Instructions in Schedule B (collectively, the "Escrow Agreement").

"Schedule A"  
(Deposits)

**50,000.00 From CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

"Schedule B"  
(Special Instructions)

- ☒ Special Instruction No. 1 (Repairs) Attached
- ☐ Special Instruction No. 1A (Completion) Attached
- ☐ Special Instruction No. 2 (Lender Completion Instructions) Attached
- ☐ Special Instruction No. 3 (Indemnity Agreement – Cash Deposit) Attached
- ☐ Special Instruction No. 4 (Depository Instructions) Attached
- ☐ Special Instruction No. 5 (F.I.R.P.T.A)
- ☐ Special Instruction No. 6A (Resolution of Miscellaneous Issues)
- ☐ Special Instruction No. 6B (Dissolution of Marriage)
- ☐ Special Instruction No. 6C (Post-Closing Occupancy Agreement)
- ☐ Special Instruction No. 6D (Pending Court Action)
- ☐ All others (See attached Exhibit "A")

The parties to the Escrow Agreement, by their signature below, acknowledge and agree that they have read, and will be bound by the Escrow Agreement, including the General Provisions to the Escrow Agreement, and the Special Instructions in Schedule B.

**Seller(s)**  
**(if applicable)**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-  
RULE MUNICIPALITY**

*Jonathan Godes*

By: \_\_\_\_\_  
**Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM**

**Buyer/Borrower(s)**  
**(if applicable)**

**ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY**

By: \_\_\_\_\_  
**DAN BLANKENSHIP, CEO**



Address: **101 W. 8TH STREET**  
**Glenwood Springs, CO 81601**  
Phone #: **(970) 945-2261**  
Fax #: \_\_\_\_\_  
Email: **asi@mountainlawfirm.com**  
Contact: **ANNA ITENBERG**

**Lender: N/A**  
(If applicable)

By: \_\_\_\_\_  
Address: **N/A**  
**N/A**  
Phone **N/A**  
#: \_\_\_\_\_  
Contact: **N/A**

Any correspondence regarding this escrow shall be addressed to:  
**Land Title Guarantee Company**  
**5975 Greenwood Plaza Blvd.**  
**Greenwood Village, Colorado 80111**  
**Attn: Escrow Coordinator**  
**Phone: 303-321-1880**  
**Fax: 303-399-8193**  
**Email: disb@ltgc.com**

Address: **2307 WULFSHON ROAD**  
**Glenwood Springs, CO 81601**  
Phone #: **(970) 925-9190**  
Fax #: \_\_\_\_\_  
Email: **taddune@compuserve.com**  
Contact: **PAUL TADDUNE**

Escrow Fees to be as Follows:

(a) Set up Fee: **50.00**  
(b) Miscellaneous: **0.00**

**N/A**

Note: After the issuance of four (4) checks, a fee of \$10.00 per  
check will be made for each additional check.

Receipt of the Escrow Deposit and acceptance of the Escrow  
Agreement hereby acknowledged by:  
Land Title Guarantee Company - Escrow Holder

*Jessica Reed*

**Jessica Reed**

**Land Title Guarantee Company**  
**General Provisions to the Escrow Agreement**

**1. Notices.**

Any notices required or permitted to be given under the Escrow Agreement shall have been deemed to have been served:

- i. one business day after the notice is hand delivered with proof of receipt by the addressee, or
- ii. one business day after transmission by facsimile evidencing confirmation of receipt by the receiving facsimile machine, or
- iii. one business day after transmission by email evidencing confirmation of receipt by the receiving email address, or
- iv. if reputable overnight courier (such as United Parcel Service or Federal Express) is used, on the immediately following business day after notice is sent for overnight delivery, or
- v. if the United States Mail is used, on the third business day after the notice is deposited in the United States Mail, postage prepaid;

Provided in each case such notice is addressed to the parties at the addresses given on the first page of this Escrow Agreement.

**2. Reliance on Notice.**

Escrow Holder may act in reliance upon any writing or instrument or signature which Escrow Holder, in good faith, believes to be genuine, and may assume the validity and accuracy of any statement or assertion contained in such a writing or instrument, and may assume that any person purporting to give any writing, notice, advice or instruction in connection with the provisions hereof has been duly authorized so to do.

**3. Laws Relating to Unclaimed Funds.**

Seller and Buyer are hereby advised that unclaimed funds may be payable to the State at some future date pursuant to unclaimed property laws, and should Escrow Holder pay any such funds held in the Escrow Deposit, Escrow Holder shall be released from all further responsibility under the Escrow Agreement and shall not be liable to any Party so long as such payment was made pursuant to applicable law.

**4. Escrow Deposit and Interest Earned on Escrow Deposit.**

- a. Upon receipt of written direction of the parties along with a completed W-9 any money comprising the Escrow Deposit will be invested in an interest bearing account.
- b. Deposits of \$100,000.00 or more may be directed by the parties hereto to other types of investments, or the Escrow Holder may invest the Escrow Deposit in Repurchase Agreements for U.S. Treasury obligations or other Federal agency issued securities.
- c. Escrow Holder shall not be responsible for maximizing the yield on the Escrow Deposit. Under no circumstances shall Escrow Holder be liable for loss of funds due to bank or other Institution failure, including employees or agents thereof, suspension or cessation of business, or any action or inaction on the part of the bank or other institution, or any delivery service transporting funds to and from the institution.
- d. All parties hereto shall execute and deliver to Escrow Holder all forms required by federal, state or other governmental agencies relative to taxation matters and Escrow Holder will file appropriate 1099 or other required forms.

**5. Fees and Expenses of Escrow Holder.**

- a. The Escrow Holder shall be entitled to reimbursement in full, or may demand payment in advance, for all costs, expenses, charges, fees or other payments made or to be made by Escrow Holder in the performance of Escrow Holder's duties and obligations under the Escrow Agreement.
- b. The parties to the Escrow Agreement are jointly and severally liable for the payment to Escrow Holder of all fees and expenses. Escrow Holder is hereby authorized and directed to reimburse to itself in payment of fees or expenses from any funds in the Escrow Deposit, whether from principal or interest or both, at any time, and from time to time, as the same may be due and owing.
- c. Escrow Holder is hereby authorized to withhold any fees or expenses from any disbursement or distribution of Escrow Deposit to any Party hereto or to the Clerk of the Court upon interpleader.
- d. In the event that the Escrow Deposit shall consist of documents only and not funds, Escrow Holder may refuse to distribute any such documents or to otherwise act under this Agreement until all accrued but unpaid fees and expenses have been paid in full.



**6. Non-liability of Escrow Holder.**

- a. Escrow Holder shall not be liable for any mistakes of fact, or errors of judgment or for any acts or omissions of any kind unless caused by the willful misconduct or gross negligence of Escrow Holder.
- b. Escrow Holder shall not be liable for any taxes, assessments or other governmental charges which may be levied or assessed upon the Escrow Deposit or any part thereof, or upon the income therefrom.
- c. Escrow Holder may rely upon the advice of counsel and upon statements of accountants, brokers or other persons reasonably believed by it in good faith to be expert in the matters upon which they are consulted, and for any reasonable action taken or suffered in good faith based upon such advice or statements.

**7. Indemnity of Escrow Holder.**

The Seller and Buyer jointly and severally, agree to:

- i. indemnify Escrow Holder for, and hold it harmless against any and all liability incurred by the Escrow Holder by reason of this Escrow Agreement, or in connection with Escrow Agent's performance of its duties hereunder, except for Escrow Holder's own willful misconduct or gross negligence, and
- ii. reimburse Escrow Holder for all its expenses, including, but not necessarily limited to, attorneys' fees and court costs incurred pursuant to this Escrow Agreement.

**8. Request for Written Instructions.**

- a. Escrow Holder may at any time, and from time to time, request the Seller and Buyer to provide written instructions concerning the propriety of a proposed payment of the Escrow Deposit, distribution of documents, or other action or refusal to act by Escrow Holder.
- b. Should the Seller and Buyer fail to provide such written instructions within a reasonable time, Escrow Holder may take such action, or refuse to act, as it may deem appropriate and shall not be liable to anyone for such action or refusal to act.
- c. Notwithstanding the foregoing, should the terms of the Escrow Agreement be complied with, in the judgment of Escrow Holder, then the Escrow Holder may disburse any funds, distribute documents, or take such action without specific further written instructions from any Party.

**9. Disputes and Interpleader.**

- a. In the event of any dispute between the Parties as to either law or fact, or in the event any of the parties hereto fail, for any reason, to fully receipt and acquit the Escrow Holder in writing, Escrow Holder may refuse, in its discretion, to carry out said escrow instructions or to deliver any funds, documents, or property in its hand to anyone and in so doing shall not become liable to demand.
- b. Escrow Holder shall be entitled to continue, without liability, to refrain and refuse to act:
  - i. until all the rights of the adverse claimants have been finally adjudicated by a court having jurisdiction over the Parties and the items affected hereby, after which time the Escrow Holder shall be entitled to act in conformity with such adjudication; or
  - ii. until all differences shall have been adjusted by agreement and Escrow Holder shall have been notified thereof and shall have been directed in writing signed jointly or in counterpart by the parties and all persons making adverse claims or demand, at which time Escrow Holder shall be protected in acting in compliance therewith.
- c. Escrow Holder also has the right to interplead into a court of competent jurisdiction at the expense of the Parties.

**10. Resignation of Escrow Holder.**

- a. Escrow Holder may resign under this Agreement by giving written notice to all of the parties hereto, effective 30 days after the date of said notice.
- b. Upon the appointment by the parties of a new escrow holder or custodian, or upon written instructions to Escrow Holder for other disposition of the Escrow Deposit, Escrow Holder shall, after retention of its accrued escrow fees and expenses, if any, shall deliver the Escrow Deposit within a reasonable period of time as so directed, and shall be relieved of any and all liability hereunder arising thereafter.

**11. Applicable Law.**

This Agreement shall be governed by the laws of the State of Colorado.

**12. Counterparts/Third Party Beneficiaries.**

This Escrow Agreement may be executed in any number of counterparts, each of which when so executed shall constitute the entire agreement between the Seller and Buyer. The Seller and Buyer acknowledge and agree that there are not intended or unintended third party beneficiaries who may rely upon or benefit from the provisions of this agreement.

**13. Electronic Signatures and Notices.**

The execution of this Escrow Agreement, and any other notice required or permitted under this Escrow Agreement, may be given and transmitted by electronic means (including email, facsimile, or similar transmission) and shall be deemed effective for all purposes. Documents with original signatures are not required. If original signatures are required by any party, this request must be made prior to execution of this Escrow Agreement or any other notice, to ensure compliance with the request.

**Schedule B to the Escrow Agreement  
Special Instructions Number 1  
(Repairs)**

1. The Escrow Deposit shall be held by Escrow Holder for the completion of the following repairs or incomplete work (the "Work") (List in detail the Work required): **SEE ATTACHED INSTRUCTIONS**

2. The Work is to be initiated by:

☐ Seller ☒ Buyer

3. The Work is to be carried out on the property located at: **2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601**

Described As:

**See attached "Exhibit A"**

4. Upon receipt of Notice from all parties stating that the Work has been completed, Escrow Holder shall release and disburse the Escrow Deposit to:

☒ Seller ☐ Buyer **After payment of all invoices for the work to be completed.**

5. In the event that Escrow Holder has not received Notice that the Work has been completed within one year from the date of this agreement **July 8th, 2020** then Escrow Holder is authorized, without notice to the parties, immediately thereafter to release and disburse the Escrow Deposit to **CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

(Seller) JS Initial \_\_\_\_ Initial \_\_\_\_

(Buyer) DB Initial \_\_\_\_ Initial \_\_\_\_

6. Escrow Holder shall have no independent duty to determine if the Work has been completed and may conclusively rely upon such Notice and may disregard any warnings or notice given it to the contrary.

7. Any and all warranty issues concerning the Work will be dealt with directly between the Purchaser, the Seller and their contractor/supplier.

8. In the event that the Work may give rise to a mechanic's or materialman's lien, which may affect the coverage provided to the parties insured under a policy of title insurance issued by Escrow Holder, as agent for its underwriter, Escrow Holder shall be entitled, in its sole discretion, to use the Escrow Deposit, or portion thereof, to pay, or to reimburse itself for the payment of, any sums of money to such mechanic's or materialman lien claimants for the protection of itself, and its insureds, under the policy of title insurance.

9. On release and disbursement of the Escrow Deposit, the Escrow Holder shall be relieved of any and all further liability in connection with the Escrow Deposit and the Escrow Agreement

**SELLER(S):**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

By: Jonathan Godes

**Jonathan Godes, Mayor**

**BUYER(S):**

**ROARING FORK TRANSPORTATION AUTHORITY, A COLORADO REGIONAL TRANSPORTATION AUTHORITY**

By: Dan Blankenship

**DAN BLANKENSHIP, CEO**



## Exhibit A

### PARCEL A:

LOT A (AMENDED), FIRST AMENDED MINOR SUBDIVISION PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER, IN THE CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO.

### PARCEL B:

THE ENTIRE PARCEL IDENTIFIED AS "MOC DRIVEWAY" IN THE SUBDIVISION PLAT OF GLENWOOD MEADOWS NO. 1, RECORDED AUGUST 9, 2004 AT RECEPTION NO. 657438 IN THE GARFIELD COUNTY CLERK AND RECORDERS OFFICE, ALSO LYING IN THE SW1/4 SECTION 5, TOWNSHIP 6 SOUTH, RANGE 89 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF GARFIELD, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN ANGLE POINT ON SAID "MOC DRIVEWAY", BEING A FOUND 5/8 REBAR AND 1.25" YELLOW PLASTIC CAP MARKED LS 38145 "V3", WHENCE THE COMMON SECTION CORNER FOR SECTIONS 5, 6, 7, AND 8 OF TOWNSHIP 6 SOUTH, RANGE 89 WEST, BEING A FOUND 2.5" ALUMINUM PIPE AND 3.25" ALUMINUM DOI/USBLM CAP PROPERLY MARKED AND DATED 1995 BEARS S69° 40' 34"W A DISTANCE OF 1079.31', ALSO BEING THE BASIS OF BEARINGS;

THENCE ALONG THE BOUNDARY LINE OF SAID "MOC DRIVEWAY" THE FOLLOWING SEVEN (7) COURSES;

1. 82.30 FEET ALONG THE ARC OF NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 1260.00 FEET, A CENTRAL ANGLE OF 3° 44' 33", THE CHORD OF WHICH BEARS N58° 16' 03"E A DISTANCE OF 82.29 FEET TO A FOUND 5/8" REBAR AND 1.5" ALUMINUM CAP MARKED LS 36580;
2. N63° 26' 47"E A DISTANCE OF 326.70 FEET;
3. 50.91 FEET ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A RADIUS OF 67.50 FEET, A CENTRAL ANGLE OF 43° 12' 59", THE CHORD OF WHICH BEARS N41° 50' 17"E A DISTANCE OF 49.71 FEET;
4. S70° 03' 24"E A DISTANCE OF 70.00 FEET;
5. 45.65 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 19° 01' 29", THE CHORD OF WHICH BEARS S29° 35' 29"W A DISTANCE OF 45.44 FEET;
6. 58.42' FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 24° 20' 50", THE CHORD OF WHICH BEARS S51° 16' 38"W A DISTANCE OF 57.98 FEET;
7. S63° 26' 47"W A DISTANCE OF 283.44 FEET TO THE POINT OF BEGINNING.

LEGAL DESCRIPTION CREATED BY:  
JOSHUA L. WILSON  
COLORADO PLS NO. 38417  
FOR, AND ON BEHALF OF SGM INC.

## ESCROW INSTRUCTIONS

In connection with the purchase and sale of the Glenwood Springs Maintenance and Operations Center ("GMOC"), the sum of Fifty Thousand (\$50,000.00) Dollars out of the proceeds due to the City of Glenwood Springs as Seller (the "City") shall be deposited with Land Title Company, as Escrow Agent, pursuant to the Escrow Agreement, to secure City's payment and reimbursement of one half (1/2) of environmental hazard remediation costs for the GMOC, up to One Hundred Thousand (\$100,000.00) Dollars, incurred by the Roaring Fork Transportation Authority ("RFTA") as Buyer, (i.e. City has agreed to pay for ½ of total remediation costs or \$50,000, whichever is less). Escrow Agent shall deposit the funds in an escrow account with FirstBank (the Escrow Account), in accordance with the following instructions.

1. The Escrow Agent shall promptly pay to vendors (or reimburse to RFTA) amounts submitted by RFTA's written request to Escrow Agent with supporting documentation. A copy of such request and documentation shall be simultaneously submitted to the City via e-mail or fax addressed to the City Manager, City Chief Operating Officer and the City Attorney. Escrow Agent shall make such payment as requested unless the City objects to such request within seven (7) business days of the receipt of such request. The City may provide notice of its objection via e-mail to the Escrow Agent and RFTA. If the City timely objects to any payment request, the amount shall not be paid to RFTA by the Escrow Agent until such time as the matter is resolved either by mutual agreement or litigation in the state courts of Garfield County or such other dispute resolution procedures as the parties may agree upon in writing.
2. Any amounts not paid out of the Escrow Account and all accrued interest remaining in the Escrow Account, if any, shall be returned to the City within thirty (30) days after City and Escrow Agent each receive a written notice from RFTA that all obligations for remediation have been completed to the satisfaction of RFTA, which remediation is anticipated by RFTA to be complete no later than October 1, 2020. Notice to the City shall be sent to the City Manager, Chief Operating Officer and the City Attorney. Notice to RFTA shall be sent to the CEO and legal counsel.
3. If RFTA objects to the reimbursement of the remaining amounts in the Escrow Account to the City after seven (7) business days of notice of intent to pay provided by Escrow Agent to RFTA and City, such amount shall not be paid by the Escrow Agent until such time as the matter is resolved either by mutual agreement or litigation in the state courts of Garfield County or such other dispute resolution procedures as the parties may agree upon in writing.
4. The prevailing party in any litigation or dispute resolution procedure shall be entitled to an award of its reasonable attorneys' fees, costs and expenses incurred in connection therewith.

### SELLER:

#### THE CITY OF GLENWOOD SPRINGS

By: 

Jonathan Godes, Mayor

**BUYER:**

**THE ROARING FORK TRANSPORTATION AUTHORITY**

By: Dan Blankenship  
Dan Blankenship, CEO

**ESCROW AGENT:**

**LAND TITLE**

By: Jessica Reed

**Schedule B to the Escrow Agreement  
Special Instructions Number 1  
(Repairs)**

1. The Escrow Deposit shall be held by Escrow Holder for the completion of the following repairs or incomplete work (the "Work") (List in detail the Work required): **SEE ATTACHED INSTRUCTIONS**

2. The Work is to be initiated by:

☐ Seller ☒ Buyer

3. The Work is to be carried out on the property located at: **2301 WULFSOHN ROAD, GLENWOOD SPRINGS, CO 81601**

Described As:

**See attached "Exhibit A"**

4. Upon receipt of Notice from all parties stating that the Work has been completed, Escrow Holder shall release and disburse the Escrow Deposit to:

☒ Seller ☐ Buyer **After payment of all invoices for the work to be completed.**

5. In the event that Escrow Holder has not received Notice that the Work has been completed within one year from the date of this agreement **July 8th, 2020** then Escrow Holder is authorized, without notice to the parties, immediately thereafter to release and disburse the Escrow Deposit to **CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

(Seller) \_\_\_\_ Initial \_\_\_\_ Initial

(Buyer) \_\_\_\_ Initial \_\_\_\_ Initial

6. Escrow Holder shall have no independent duty to determine if the Work has been completed and may conclusively rely upon such Notice and may disregard any warnings or notice given to the contrary.

7. Any and all warranty issues concerning the Work will be dealt with directly between the Purchaser, the Seller and their contractor/supplier.

8. In the event that the Work may give rise to a mechanic's or materialman's lien, which may affect the coverage provided to the parties insured under a policy of title insurance issued by Escrow Holder, as agent for its underwriter, Escrow Holder shall be entitled, in its sole discretion, to use the Escrow Deposit, or portion thereof, to pay, or to reimburse itself for the payment of, any sums of money to such mechanic's or materialman lien claimants for the protection of itself, and its insureds, under the policy of title insurance.

9. On release and disbursement of the Escrow Deposit, the Escrow Holder shall be relieved of any and all further liability in connection with the Escrow Deposit and the Escrow Agreement

**SELLER(S):**

**CITY OF GLENWOOD SPRINGS, A COLORADO HOME-RULE MUNICIPALITY**

*Jonathan Godes*

By: \_\_\_\_\_  
**Jonathan Godes, Mayor Signed 07/07/20 at 02:26PM**

**BUYER(S):**

**ROARING FORK TRANSPORTATION AUTHORITY, A  
COLORADO REGIONAL TRANSPORTATION  
AUTHORITY**

By: \_\_\_\_\_  
**DAN BLANKENSHIP, CEO**





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LOT A (AMENDED), FIRST AMENDED MINOR SUBDIVISION PLAT OF GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER, IN THE CITY OF GLENWOOD SPRINGS, COUNTY OF GARFIELD, STATE OF COLORADO.

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BEGINNING AT AN ANGLE POINT ON SAID "MOC DRIVEWAY", BEING A FOUND 5/8 REBAR AND 1.25" YELLOW PLASTIC CAP MARKED LS 38145 "V3", WHENCE THE COMMON SECTION CORNER FOR SECTIONS 5, 6, 7, AND 8 OF TOWNSHIP 6 SOUTH, RANGE 89 WEST, BEING A FOUND 2.5" ALUMINUM PIPE AND 3.25" ALUMINUM DOI/USBLM CAP PROPERLY MARKED AND DATED 1995 BEARS S69° 40' 34"W A DISTANCE OF 1079.31', ALSO BEING THE BASIS OF BEARINGS;

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2. N63°26'47"E A DISTANCE OF 326.70 FEET;
3. 50.91 FEET ALONG THE ARC OF A CURVE TO THE LEFT, HAVING A RADIUS OF 67.50 FEET, A CENTRAL ANGLE OF 43°12'59", THE CHORD OF WHICH BEARS N41°50'17"E A DISTANCE OF 49.71 FEET;
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5. 45.65 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 19°01'29", THE CHORD OF WHICH BEARS S29°35'29"W A DISTANCE OF 45.44 FEET;
6. 58.42' FEET ALONG THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 137.47 FEET, A CENTRAL ANGLE OF 24°20'50", THE CHORD OF WHICH BEARS S51°16'38"W A DISTANCE OF 57.98 FEET;
7. S63°26'47"W A DISTANCE OF 283.44 FEET TO THE POINT OF BEGINNING.

LEGAL DESCRIPTION CREATED BY:  
JOSHUA L. WILSON  
COLORADO PLS NO. 38417  
FOR, AND ON BEHALF OF SGM INC.

# GARFIELD COUNTY TREASURER

## Certificate of Taxes Due

Account Number R009166

Parcel 218506436001

Assessed To

GLENWOOD SPRINGS, CITY OF  
2307 WULFSOHN  
GLENWOOD SPRINGS, CO 81601

Certificate Number 2019-01975

Acres 29.974

Order Number 63014212

Vendor ID 4

Land Title  
1317 Grand Ave  
#200  
Glenwood Springs, CO 81601

### Legal Description

### Situs Address

Section: 6 Township: 6 Range: 89 Subdivision: GLENWOOD SPRINGS MUNICIPAL Lot: A  
OPERATION CENTER

| Year                             | Tax | Interest | Fees | Payments | Balance |
|----------------------------------|-----|----------|------|----------|---------|
| Grand Total Due as of 09/19/2019 |     |          |      |          | \$0.00  |

Tax Billed at 2018 Rates for Tax Area 054 - 1G-1DF - 054

| Authority                   | Mill Levy  | Amount | Values           | Actual      | Assessed    |
|-----------------------------|------------|--------|------------------|-------------|-------------|
| GARFIELD COUNTY             | 13.6550000 | \$0.00 | EXEMPT-POLITICAL | \$855,470   | \$248,090   |
| CITY OF GLENWOOD SPGS       | 8.6150000  | \$0.00 | SD-LAND          |             |             |
| COLO RIVER WATER CONS       | 0.2560000  | \$0.00 | EXEMPT-POLITICAL | \$3,791,080 | \$1,099,410 |
| WEST DIVIDE WATER CON       | 0.0370000* | \$0.00 | SD-IMPS.         |             |             |
| SCHOOL DISTRICT RE-1        | 44.0410000 | \$0.00 | Total            | \$4,646,550 | \$1,347,500 |
| COLORADO MTN COLLEGE        | 3.9970000  | \$0.00 |                  |             |             |
| GARFIELD COUNTY PUBLIC LIBR | 1.0720000  | \$0.00 |                  |             |             |
| RFTA                        | 2.2490000* | \$0.00 |                  |             |             |
| Taxes Billed 2018           | 73.9220000 | \$0.00 |                  |             |             |

\* Credit Levy

All Tax Lien Sale amounts are subject to change due to endorsement of current taxes by the lienholder or to advertising and distraint warrant fees. Changes may occur and the Treasurer's Office will need to be contacted prior to remittance after September 1, 2019. TAX LIEN SALE REDEMPTION AMOUNTS MUST BE PAID BY CASH OR CASHIER'S CHECK.

Special taxing districts and the boundaries of such districts may be on file with the Board of County Commissioners, the County Clerk, or the County Assessor.

This certificate does not include land or improvements assessed under a separate account number, personal property taxes, transfer tax or misc. tax collected on behalf of other entities, special or local improvement district assessments or mobile homes, unless specifically mentioned.

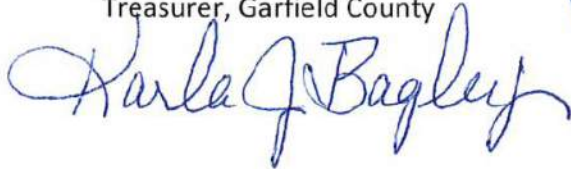
I, the undersigned, do hereby certify that the entire amount of taxes due upon the above described parcels of real property and all outstanding sales for unpaid taxes as shown by the records in my office from which the same may still be redeemed with the amount required for redemption are as noted herein. In witness whereof, I have hereunto set my hand and seal.

# GARFIELD COUNTY TREASURER

## Certificate of Taxes Due

---

Karla J. Bagley  
Treasurer, Garfield County



109 8<sup>th</sup> Street, Suite 204  
Glenwood Springs, CO 81601

## **Appendix B: Traffic Impact Study**

# TRAFFIC IMPACT STUDY

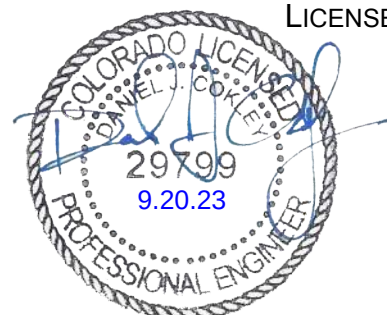
## RFTA GMF ULTIMATE BUILDOUT



Prepared by



DAN COKLEY, PE, PTOE  
LICENSE NO. 29799  
9/19/2023



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## 1.0 Introduction

This traffic impact study is prepared using the guidelines of a Colorado Department of Transportation (CDOT) Level Three Traffic Impact Study (TIS) and will satisfy City of Glenwood Springs Engineering Standards Chapter 5.11 Traffic Impact Analysis Standards. This TIS provides an estimate for design hour traffic generation for the RFTA Glenwood Maintenance Facility (GMF) and adjacent Park and Ride lot proposed expansion which is planned to occur in several phases over several years.

The City has provided the Glenwood Meadows Master Traffic Study (GMMTS) prepared by Kimley-Horn (K-H) and dated January 2023. The GMMTS provides a comprehensive overview of the entire Meadows area, from the I-70 #114 interchange on the northwest to Midland Ave. and 8<sup>th</sup> Street and downtown to Grand Ave. and reviews 2022, 2030, and 2040 scenarios that include the overall Glenwood Meadows projected development and consideration of increased background traffic. The GMMTS included the development of the RFTA GMF and Park and Ride (Zone 5) in those scenarios based on RFTA programming obtained from the RFTA Regional Transit Center (RTC) Traffic Analysis prepared by Shrewsberry for RFTA dated March 2018. This TIS provides updated projections for the RFTA ultimate buildout scenario and substitutes the “Zone 5” 2018 RFTA traffic projections in the GMMT for the RFTA ultimate buildout traffic projections developed in this study.

The purpose of this study is to simulate the 2023 Baseline operational conditions from the GMMTS and provide the trip generation, distribution, and traffic assignment for the RFTA ultimate buildout programming. It will provide an analysis of the study intersections for safety and operational impacts.

The roadway network and study area is depicted in Figure 1. The existing RFTA parcel(s) straddle Wulfsohn Road on the west end near Midland Ave. The existing GMF is on the south side and Park and Ride (P&R) lot on the north side of Wulfsohn.



FIGURE 1 - STUDY AREA



The study intersections are as follows.

- Midland Ave. and West Wulfsohn Rd. (#4)
- Wulfsohn Rd. and RFTA GMF / P&R (#20)
- 8th and Colorado (#13)
- 9th and Colorado (#15)
- 9th and Grand (#16)

The study intersections are shown in Figure 2.



FIGURE 2 - STUDY INTERSECTIONS

## 1.1 Project Description

The RFTA GMF is located on the west end of Wulfsohn Road in Glenwood Springs, Colorado. The ultimate development of the site and phasing will be analyzed in this TIS. A

summary of the future development phases are outlined below and buildout is depicted in Figure 3.

- **Phase 3/4/5/7** - An increase from current operation to a 60-bus option is outlined in this study. 13,100sf of new operations center.
- **Phase 6** - 19,237 sf Administration building.
- **Phase 8** - 9,600 sf Warehouse storage.
- **Phase 9** - 74 employee housing units and additional 45-space Park and Ride expansion (total 130-space).



FIGURE 3 - OVERALL SITE PLAN (ULTIMATE BUILDOUT)

## 2.0 Methodology and Assumptions

This traffic impact study has been prepared in accordance with section 2.3(5) of the State Highway Access Code (SHAC) and the methodology and assumptions are provided in this section. The assumptions will provide a conservative analysis for the purposes of assessing operational and safety traffic impacts resulting from the proposed phased development.

This analysis uses HCM 6th Edition methodology and was performed using the Synchro 11 analysis package to estimate the capacity of the intersections. The MOE's that are compared for this study include LOS, delay and 95th percentile queue length. The MOE's will be reported for each analysis scenario to determine if the current intersections operate adequately. The 95<sup>th</sup> percentile queue length reported is based upon the average of ten 60-minute Simtraffic modeling runs.

**Previous Study Background** - We used the GMMTS for future Glenwood Meadows (GM) developed traffic (less RFTA Zone 5 traffic), distribution and assignment of future traffic, and growth factor beyond the GM developed traffic as presented in the GMMTS. The city has shared the GMMTS Synchro model to provide consistency with the previous modeling. Only the study intersection traffic volumes have been updated in the model. GM developed traffic volumes have been adjusted by subtracting the RFTA (Zone 5) volumes generated by the

GMMTS. Updated RFTA ultimate buildout traffic volumes are generated in this study based on the development outlined in section 1.1 above.

**Baseline Traffic** - The City provided the 2023 GMMTS containing 2022 adjusted traffic volumes. New traffic counts performed by SGM on 4/25-26/2023 were completed for the following intersections:

- Midland and West Wulfsohn (7-9a; 4-6:30p)
- Wulfsohn and RFTA GMF / P&R (7-9a; 4-6:30p)
- 8th and Colorado (11a-1:30p; 4-6:30p)
- 9th and Colorado (11a-1:30p; 4-6:30p)
- 9th and Grand (11a-1:30p; 4-6:30p)

Baseline traffic counts were not adjusted using a seasonal factor based on CDOT count station on SH 82 in South Glenwood.

The GMMTS 2022 adjusted volumes, collected on a Thursday, were consistently greater than the Tuesday/Wednesday volumes collected by SGM. To normalize the 2023 SGM traffic volumes, a factor was established for each intersection to match the total intersection volume at each intersection counted by SGM as compared to the GMMTS 2022 adjusted volumes. The 2023 peak hour traffic volumes at the Wulfsohn / RFTA intersection were factored using the Midland / West Wulfsohn intersection.

### Analysis Years

Operational analysis of Baseline traffic (2023), 20-year Background traffic (2043) and 20-year Total traffic (2043) will be completed. Total traffic (2043) is split into two scenarios - one including the RFTA ultimate buildout traffic and another also including the GM developed traffic. Each scenario is explained in detail below.

- Baseline Traffic (2023) - Volumes based on adjusted traffic counts performed by SGM, as outlined above.
- Background Traffic (2043) - The volumes for this scenario were calculated by applying an annual growth rate of 0.5% to the Baseline volumes outside the immediate Glenwood Meadows travelshed - i.e., through traffic on Midland Ave. and any downtown intersections.
- Total RFTA traffic (2043) - RFTA ultimate buildout traffic volumes generated by SGM were added to the 2043 Background traffic scenario above. Comparing the results of this scenario to the 2043 Background scenario will determine the extent of traffic impacts due to RFTA development.
- Total GM + RFTA traffic (2043) - The adjusted GM developed traffic volumes are added to the Total RFTA traffic (2043) scenario above. The Total GM + RFTA traffic scenario provides a comparison of the extent of traffic impacts due to GM development.

The GMMTS provides a comprehensive overview of the entire Meadows area, and provides analysis for the 2022, 2030, and 2040 scenarios that include projected development and consideration of increased background traffic.

### Trip Generation Rates

The proposed trip generation for the development is described by phase and land use type below. Land use rates were developed from the ITE Trip Generation Manual, 11th Edition, unless noted otherwise.





- **Phase 3/4/5/7** - An increase from current operation to a 60-bus option is outlined in this study. This includes an increased bus schedule and associated staffing. Trip generation and volumes from RFTA developed 60-bus program (provided in Appendix F). 13,100sf of new operations center (office) Use General Office Building (Code 710) land use from ITE.
- **Phase 6** - 19,237 sf Administration building. Use General Office Building (Code 710) land use from ITE.
- **Phase 8** - 9,600 sf Warehouse storage. No additional staffing, no additional trips.
- **Phase 9** - 74 employee housing units and additional 45-space Park and Ride expansion (total 130-space). Use Park and Ride (Code 090) and Multi-Family Housing, Mid-rise (Code 221) land uses from ITE.

TABLE 1 - TRIP GENERATION RATES

| Land Use                          | Number of Units | Design Hour Rates |                                                     |         |             |            |         |             |            |
|-----------------------------------|-----------------|-------------------|-----------------------------------------------------|---------|-------------|------------|---------|-------------|------------|
|                                   |                 | ITE Code          | Weekday Rate                                        | AM Rate | AM Entering | AM Exiting | PM Rate | PM Entering | PM Exiting |
| Ph9-Park and Ride                 | 45              | 90                | 4.76                                                | 0.73    | 0.59        | 0.15       | 0.58    | 0.14        | 0.43       |
| Ph8-Warehousing                   | 9.6             | 150               | 1.71                                                | 0.17    | 0.13        | 0.04       | 0.18    | 0.05        | 0.13       |
| Ph9-Multi-Family (Mid-rise)       | 74              | 221               | 4.15                                                | 0.28    | 0.07        | 0.21       | 0.39    | 0.24        | 0.15       |
| Ph3-General Office Building (ksf) | 13.1            | 710               | 15.11                                               | 2.23    | 1.96        | 0.27       | 2.37    | 0.40        | 1.96       |
| Ph6-General Office Building (ksf) | 19.2            | 710               | 14.40                                               | 2.11    | 1.86        | 0.25       | 2.18    | 0.37        | 1.81       |
| Ph3/4/5/7 - 60 Bus expansion      |                 | *                 | * based on RFTA 60-bus projections (by RFTA 6/2023) |         |             |            |         |             |            |

TABLE 2 - TRIP DISTRIBUTION

|                               | ITE Code | Basis of Rate | Time Period Used Above    | Weekday Design Hour Distribution |        |       |        |
|-------------------------------|----------|---------------|---------------------------|----------------------------------|--------|-------|--------|
|                               |          |               |                           | AM IN                            | AM OUT | PM IN | PM OUT |
| Ph9-Park and Ride             | 90       | Fitted Curve  | Peak Hour adjacent Street | 80%                              | 20%    | 25%   | 75%    |
| Ph8-Warehousing               | 150      | Ave Rate      | Peak Hour adjacent Street | 77%                              | 23%    | 28%   | 72%    |
| Ph9-Multi-Family (Mid-rise)   | 221      | Fitted Curve  | Peak Hour adjacent Street | 26%                              | 74%    | 61%   | 39%    |
| General Office Building (ksf) | 710      | Fitted Curve  | Peak Hour adjacent Street | 88%                              | 12%    | 17%   | 83%    |

### Design Hour Volume

The design hour volumes calculated in this study are based upon the peak hour of the adjacent street traffic for the proposed development land use types. The design hour volume used in this study is estimated to be the 30<sup>th</sup> highest hourly volume of the design year.

### Trip Reductions

Multi-modal trips could consist of walking, biking, car-pooling and transit options. The proximity of the RFTA GMF to the Park and Ride lot and as the hub of the Colorado River and Roaring Fork valleys transit network that makes the location convenient for all transportation modes.

Glenwood Springs is an area known for hiking and biking, along with that comes increased percentages of valley residents who use those modes of transportation for commuting and other trips that typically would have been taken with vehicles. The typical US average walking and biking distance for a commute or other trip is 0.25 miles and 3 miles, respectively. With more prevalent use of alternative transportation in the region, it would be reasonable to assume those distances are increased in the area. The Glenwood Meadows mixed use area is within walking and biking distance from the site.



Given the multi-modal opportunities, a 10% reduction in trips associated with potential future employees (Operations and Administration buildings) and potential future residents (multi-Family housing) is conservatively applied and summarized below.

- Phase 3/4/5/7 - 10% transit reduction applied to office
- Phase 6 - 10% transit reduction applied to office
- Phase 8 - No additional trips.
- Phase 9 - 10% transit reduction applied to housing

### Project Traffic Distribution

RFTA trip distribution is based on 2023 traffic distribution at project intersection for each leg with consideration given to GMMTS assumptions (90% oriented westerly / 10% oriented easterly). The Bus distribution is based on future RFTA programming.

## 2.1 Intersection Capacity Analysis

AM and PM level of service estimates were prepared in accordance with the Highway Capacity Manual 6<sup>th</sup> Edition (Transportation Research Board, 2016). For signalized intersections, the HCM measures level of service in terms of seconds of delay per vehicle. This is also a measure of driver discomfort, fuel consumption, and lost travel time. The table below relates the LOS to seconds of delay per vehicle at a signalized intersection.

TABLE 3 - LEVEL OF SERVICE (LOS) CRITERIA SIGNALIZED INTERSECTIONS

| Level of Service | Delay (seconds) |
|------------------|-----------------|
| A                | < 10.0          |
| B                | 10.1 to 20      |
| C                | 20.1 to 35      |
| D                | 35.1 to 55      |
| E                | 55.1 to 80      |
| F                | > 80.0          |

Source: *Highway Capacity Manual*, 2016

For unsignalized intersections, the Highway Capacity Manual defines level of service and delay in terms of seconds of stopped delay per vehicle, which is based on the number of acceptable gaps in the conflicting traffic stream. In general, the traffic movements analyzed are those controlled by stop signs or yield signs, and the left turn movements from the uncontrolled major street. The following table represents the level of service criteria for unsignalized intersections:

TABLE 4 - LEVEL OF SERVICE (LOS) CRITERIA UNSIGNALIZED INTERSECTIONS

| Level of Service | Delay (seconds) |
|------------------|-----------------|
| A                | < 10.0          |
| B                | 10.1 to 15      |
| C                | 15.1 to 25      |
| D                | 25.1 to 35      |
| E                | 35.1 to 50      |
| F                | > 50.0          |

Source: *Highway Capacity Manual*, 2016

The “overall” intersection level of service at a signalized or an unsignalized intersection corresponds with the average delay experienced on the minor street approaches and the uncontrolled major street movements. The unconflicted major street through movements are considered to have no delay. Because most of the intersection movements are major street

movements with no delay, the overall intersection results in a LOS with less delay than the minor street approaches and conflicting major street movements (left turns) experience.

In general, CDOT and the City consider the overall intersection operation of LOS “D” or better acceptable during the peak hours. The goal is to also provide a similar LOS for each controlled intersection movement and/or approach.

This study will assess the operational measures of effectiveness (MOE’s) including Level of Service (LOS), Delay, and 95<sup>th</sup> percentile queue. The MOE analysis by movement provides an overview of all intersection approach and conflicting movements and provides a more realistic picture of operations by controlled movement or approach as experienced and perceived by users. The MOE’s also provide a valuable reference point for comparison of LOS, Delay and Queue between scenarios.

### 3.0 Baseline Traffic Conditions (2023)

#### 3.1 Existing Roadways and Intersections

Roadway and intersection descriptions are provided in the GMMTS are accurate at the time of this study and are provided in the Appendix. The GMMTS Synchro model is the basis for this study and serves to replicate the 2022 results from the GMMTS to provide a comparative baseline to understand potential impacts with the addition of the Background, RFTA, and GM traffic volumes.

#### 3.2 Baseline Intersection Capacity Analysis

Using the Baseline traffic volumes provided in Appendix A the capacity analysis was modeled in Synchro to estimate level of service and delay for each intersection.

Table 5 shows the overall results of the capacity analysis for the intersections in the study area. The study intersections operate at an acceptable overall LOS C or better under baseline conditions.

The MOE’s; LOS, delay (seconds) and 95th percentile queue lengths (feet) by approach movement are also presented in Table 5 and provide a reference point of 2023 Baseline traffic conditions to understand the effect of growth unrelated to the proposed development provided in the 2043 Background traffic volumes. All but Grand Ave side street approach movements operate at an acceptable LOS D or better under baseline conditions. 9<sup>th</sup> Street approach movements operate at LOS E or worse during the AM and PM peak hour.

Queuing is reported for each approach movement at the study intersections to provide another indication of intersection performance. A queue length of 20 ft represents a single vehicle. Highlighted queue lengths indicate that the queue length exceeds the link or storage bay distance and is depicted in the following MOE tables as shown below.

\*95th percentile queue exceeds link distance

\*95th percentile queue exceeds storage bay distance

\*\*Modeled link distance differs from actual link distance

The Baseline scenario shows results with 95<sup>th</sup> percentile queue lengths well below or near existing storage bay or link lengths.

TABLE 5 - BASELINE - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2023 Baseline |               |     |       |                  |
|---------------------------------------|-------------------|----|-----------------------------------|---------------|---------------|-----|-------|------------------|
|                                       |                   |    |                                   | Overall LOS   | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A             | 2.2           | A   | 7.5   | 8                |
|                                       |                   | PM |                                   | A             | 2.7           | A   | 7.3   | 7                |
|                                       | WB L              | AM | 1500**                            |               |               | A   | 7.3   | 7                |
|                                       |                   | PM |                                   |               |               | A   | 7.4   | 6                |
|                                       | NB R              | AM | 334**                             |               |               | A   | 8.5   | 20               |
|                                       |                   | PM |                                   |               |               | A   | 8.7   | 23               |
|                                       | NB T/L            | AM | 334**                             |               |               | B   | 10.1  | 42               |
|                                       |                   | PM |                                   |               |               | A   | 9.8   | 41               |
|                                       | SB                | AM | 254**                             |               |               | A   | 9.9   | 33               |
|                                       |                   | PM |                                   |               |               | A   | 9.3   | 35               |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | A             | 1.4           | A   | 8.3   | 29_0_27          |
|                                       |                   | PM |                                   | A             | 2.4           | A   | 9.8   | 31_0_28          |
|                                       | WB L              | AM | 95_1350                           |               |               | B   | 10.6  | 6_2              |
|                                       |                   | PM |                                   |               |               | A   | 8.5   | 6_2              |
|                                       | NB                | AM | 825                               |               |               | D   | 27.9  | 57               |
|                                       |                   | PM |                                   |               |               | D   | 32.1  | 66               |
|                                       | SB T/L            | AM | 327                               |               |               | C   | 24.6  | 35               |
|                                       |                   | PM |                                   |               |               | C   | 21.8  | 32               |
|                                       | SB R              | AM | 75                                |               |               | B   | 10.6  | 27               |
|                                       |                   | PM |                                   |               |               | C   | 16.9  | 26               |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | B             | 11            | B   | 10.3  | 87               |
|                                       |                   | PM |                                   | B             | 10.2          | B   | 10.7  | 97               |
|                                       | WB                | AM | 226                               |               |               | B   | 12.1  | 137              |
|                                       |                   | PM |                                   |               |               | B   | 10.2  | 146              |
|                                       | NB                | AM | 404                               |               |               | B   | 10.3  | 50               |
|                                       |                   | PM |                                   |               |               | A   | 9.2   | 53               |
|                                       | SB                | AM | 398                               |               |               | A   | 9.1   | 49               |
|                                       |                   | PM |                                   |               |               | A   | 9.2   | 55               |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A             | 8.8           | A   | 8.1   | 51               |
|                                       |                   | PM |                                   | A             | 8             | A   | 7.9   | 54               |
|                                       | WB                | AM | 211                               |               |               | A   | 8     | 62               |
|                                       |                   | PM |                                   |               |               | A   | 7.8   | 63               |
|                                       | NB                | AM | 418                               |               |               | A   | 7.9   | 15               |
|                                       |                   | PM |                                   |               |               | --  | --    | --               |
|                                       | SB                | AM | 404                               |               |               | A   | 9.3   | 78               |
|                                       |                   | PM |                                   |               |               | A   | 8.2   | 79               |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | A             | 9.8           | D   | 42    | 59               |
|                                       |                   | PM |                                   | C             | 20.5          | E   | 76.2  | 72               |
|                                       | EB T/R            | AM | 211                               |               |               | D   | 45.4  | 75               |
|                                       |                   | PM |                                   |               |               | E   | 79.9  | 83               |
|                                       | WB L              | AM | 75                                |               |               | D   | 43.5  | 62               |
|                                       |                   | PM |                                   |               |               | E   | 71.8  | 58               |
|                                       | WB T/R            | AM | 277                               |               |               | D   | 45.3  | 70               |
|                                       |                   | PM |                                   |               |               | F   | 91.4  | 70               |
|                                       | NB L              | AM | 150                               |               |               | A   | 6.9   | 116              |
|                                       |                   | PM |                                   |               |               | A   | 7.4   | 147              |
|                                       | NB TT/R           | AM | 433_433                           |               |               | B   | 11.4  | 266_227          |
|                                       |                   | PM |                                   |               |               | B   | 16.9  | 306_261          |
|                                       | SB L              | AM | 125                               |               |               | A   | 8.2   | 49               |
|                                       |                   | PM |                                   |               |               | B   | 13.3  | 59               |
|                                       | SB TT/R           | AM | 412_412                           |               |               | A   | 1.2   | 164_173          |
|                                       |                   | PM |                                   |               |               | B   | 10.7  | 218_213          |

1 – Delay expressed as average delay per vehicle in seconds/vehicle

## 4.0 Background Traffic (2043)

The Baseline 2023 traffic volumes were used as a basis to develop the 20-year) Background (2043) traffic volumes. The Midland Ave through movements and the intersections in the downtown area were adjusted using a 20-year growth factor of 1.105. No growth factor was applied to the project intersection on Wulfsohn Rd.

### 4.1 Background Intersection Capacity Analysis

Using the 2043 Background traffic volumes, the capacity analysis was modeled in Synchro to determine level of service and delay for the access. The 2043 Background traffic volumes are provided in Appendix A.

Table 6 shows the overall results of the capacity analysis for the study intersections. The study intersections operate at an overall LOS C or better.

MOE analysis is also presented in Table 6 and provides an overview of intersection approach movements for 2043 Background traffic conditions for comparison to 2023 Baseline traffic conditions to understand the effect of background traffic volumes. Similar to the 2023 Baseline scenario, the Grand Ave side street approach movements operate at LOS E or worse during the AM and PM peak hour. The NB Wulfsohn Rd approach to Midland also degrades to LOS E during the PM design hour due to the increased background Midland through traffic.

Overall, the approach movement queue lengths increase slightly from Baseline to Background volumes, near the rate of the 20-year growth factor applied to the model. The NB PM design hour SH 82 through movement queue length exceeds the existing storage between the 9<sup>th</sup> and 10<sup>th</sup> Street intersections. 9<sup>th</sup> Street side street storage bay lengths are also slightly exceeded by the modeled queues.

TABLE 6 - BACKGROUND - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2023 Baseline |               |     |       |                  | 2043 Background |               |     |       |                  |
|---------------------------------------|-------------------|----|-----------------------------------|---------------|---------------|-----|-------|------------------|-----------------|---------------|-----|-------|------------------|
|                                       |                   |    |                                   | Overall LOS   | Overall Delay | LOS | Delay | 95th % Q (L_T_R) | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A             | 2.2           | A   | 7.5   | 8                | A               | 2.2           | A   | 7.5   | 7                |
|                                       |                   | PM |                                   | A             | 2.7           | A   | 7.3   | 7                | A               | 2.7           | A   | 7.3   | 4                |
|                                       | WB L              | AM | 1500**                            |               |               | A   | 7.3   | 7                |                 |               | A   | 7.3   | 6                |
|                                       |                   | PM |                                   |               |               | A   | 7.4   | 6                |                 |               | A   | 7.3   | 2                |
|                                       | NB R              | AM | 334**                             |               |               | A   | 8.5   | 20               |                 |               | A   | 8.5   | 23               |
|                                       |                   | PM |                                   |               |               | A   | 8.7   | 23               |                 |               | A   | 8.7   | 22               |
|                                       | NB T/L            | AM | 334**                             |               |               | B   | 10.1  | 42               |                 |               | B   | 10.1  | 41               |
|                                       |                   | PM |                                   |               |               | A   | 9.8   | 41               |                 |               | A   | 9.8   | 40               |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | A             | 1.4           | A   | 8.3   | 29_0_27          | A               | 1.4           | A   | 8.4   | 31_0_28          |
|                                       |                   | PM |                                   | A             | 2.4           | A   | 9.8   | 31_0_28          | A               | 2.6           | B   | 10.3  | 14_8_31          |
|                                       | WB L              | AM | 95_1350                           |               |               | B   | 10.6  | 6_2              |                 |               | B   | 11.1  | 6_2              |
|                                       |                   | PM |                                   |               |               | A   | 8.5   | 6_2              |                 |               | A   | 8.6   | 20_17            |
|                                       | NB                | AM | 825                               |               |               | D   | 27.9  | 57               |                 |               | D   | 32.8  | 66               |
|                                       |                   | PM |                                   |               |               | D   | 32.1  | 66               |                 |               | E   | 39.4  | 82               |
|                                       | SB T/L            | AM | 327                               |               |               | C   | 24.6  | 35               |                 |               | D   | 27.6  | 32               |
|                                       |                   | PM |                                   |               |               | C   | 21.8  | 32               |                 |               | C   | 24.3  | 40               |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | B             | 11            | B   | 10.3  | 87               | B               | 12.1          | B   | 11.1  | 97               |
|                                       |                   | PM |                                   | B             | 10.2          | B   | 10.7  | 97               | B               | 10.8          | B   | 11.5  | 166              |
|                                       | WB                | AM | 226                               |               |               | B   | 12.1  | 137              |                 |               | B   | 13.7  | 146              |
|                                       |                   | PM |                                   |               |               | B   | 10.2  | 146              |                 |               | B   | 10.9  | 105              |
|                                       | NB                | AM | 404                               |               |               | B   | 10.3  | 50               |                 |               | A   | 9.8   | 53               |
|                                       |                   | PM |                                   |               |               | A   | 9.2   | 53               |                 |               | A   | 9.5   | 72               |
|                                       | SB                | AM | 398                               |               |               | A   | 9.1   | 49               |                 |               | A   | 9.5   | 55               |
|                                       |                   | PM |                                   |               |               | A   | 9.2   | 55               |                 |               | A   | 9.5   | 60               |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A             | 8.8           | A   | 8.1   | 51               | A               | 9.1           | A   | 8.3   | 54               |
|                                       |                   | PM |                                   | A             | 8             | A   | 7.9   | 54               | A               | 8.1           | A   | 8     | 53               |
|                                       | WB                | AM | 211                               |               |               | A   | 8     | 62               |                 |               | A   | 8.2   | 63               |
|                                       |                   | PM |                                   |               |               | A   | 7.8   | 63               |                 |               | A   | 7.9   | 60               |
|                                       | NB                | AM | 418                               |               |               | A   | 7.9   | 15               |                 |               | A   | 8     | 16               |
|                                       |                   | PM |                                   |               |               | --  | --    | --               |                 |               | --  | --    | --               |
|                                       | SB                | AM | 404                               |               |               | A   | 9.3   | 78               |                 |               | A   | 9.7   | 79               |
|                                       |                   | PM |                                   |               |               | A   | 8.2   | 79               |                 |               | A   | 8.4   | 52               |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | A             | 9.8           | D   | 42    | 59               | B               | 10.5          | D   | 41.7  | 72               |
|                                       |                   | PM |                                   | C             | 20.5          | E   | 76.2  | 72               | C               | 23.2          | E   | 76.1  | 95               |
|                                       | EB T/R            | AM | 211                               |               |               | D   | 45.4  | 75               |                 |               | D   | 45.4  | 83               |
|                                       |                   | PM |                                   |               |               | E   | 79.9  | 83               |                 |               | F   | 80.3  | 120              |
|                                       | WB L              | AM | 75                                |               |               | D   | 43.5  | 62               |                 |               | D   | 43.3  | 58               |
|                                       |                   | PM |                                   |               |               | E   | 71.8  | 58               |                 |               | E   | 71.5  | 104              |
|                                       | WB T/R            | AM | 277                               |               |               | D   | 45.3  | 70               |                 |               | D   | 45.2  | 70               |
|                                       |                   | PM |                                   |               |               | F   | 91.4  | 70               |                 |               | F   | 97.3  | 222              |
|                                       | NB L              | AM | 150                               |               |               | A   | 6.9   | 116              |                 |               | A   | 7.3   | 147              |
|                                       |                   | PM |                                   |               |               | A   | 7.4   | 147              |                 |               | A   | 8.1   | 144              |
|                                       | NB TT/R           | AM | 433_433                           |               |               | B   | 11.4  | 266_227          |                 |               | B   | 12.7  | 306_261          |
|                                       |                   | PM |                                   |               |               | B   | 16.9  | 306_261          |                 |               | C   | 20.4  | 553_556          |
|                                       | SB L              | AM | 125                               |               |               | A   | 8.2   | 49               |                 |               | A   | 8.9   | 59               |
|                                       |                   | PM |                                   |               |               | B   | 13.3  | 59               |                 |               | B   | 17.8  | 73               |
| #16 9th St. and Grand Ave.            | SB TT/R           | AM | 412_412                           |               |               | A   | 1.2   | 164_173          |                 |               | A   | 1.5   | 218_213          |
|                                       |                   | PM |                                   |               |               | B   | 10.7  | 218_213          |                 |               | B   | 11.7  | 264_251          |

1 – Delay expressed as average delay per vehicle in seconds/vehicle



## 5.0 Total RFTA Traffic (2043) - Background plus RFTA Ultimate

### 5.1 Project Intersection

The RFTA GMF, P&R, and the project intersection (#20) are shown in Figure 4 below.



FIGURE 4 - RFTA GMF / PARK AND RIDE INTERSECTION WITH WULFSOHN ROAD

### 5.2 Project Access Trip Generation and Assignment

Using the trip generation rate and distribution assumptions provided in 2.0 Methodology the resulting trip generation by land use is provided in Table 7, trip generation by phase is provided in Table 8. Table 7 also applies the 10% trip reduction factor and present the reduced traffic volumes.



TABLE 7 -- ACCESS DESIGN HOURLY VOLUME BY LAND USE

| Land Use                                 | Number of Units | Weekday Traffic | Weekday Design Hour Traffic |           |            |            |
|------------------------------------------|-----------------|-----------------|-----------------------------|-----------|------------|------------|
|                                          |                 |                 | AM IN                       | AM OUT    | PM IN      | PM OUT     |
| Ph9-Park and Ride                        | 45              | 214             | 26                          | 7         | 7          | 20         |
| Ph8-Warehousing                          | 9.6             | 16              | 1                           | 0         | 0          | 1          |
| Ph9-Multi-Family (Mid-rise)              | 74              | 307             | 5                           | 16        | 18         | 11         |
| Ph3-General Office Building (ksf)        | 13.1            | 198             | 26                          | 3         | 5          | 26         |
| Ph6-General Office Building (ksf)        | 19.2            | 277             | 36                          | 5         | 7          | 35         |
| Ph3/4/5/7 - 60 Bus expansion             |                 |                 | 3                           | 14        | 4          | 8          |
| <b>Total Traffic</b>                     |                 | <b>1,012</b>    | <b>97</b>                   | <b>45</b> | <b>41</b>  | <b>101</b> |
| <b>Total DHV</b>                         |                 |                 | <b>142</b>                  |           | <b>142</b> |            |
| <i>Ph9 HOUSING 10% Transit Reduction</i> |                 | 276             | 5                           | 14        | 16         | 10         |
| <i>Ph3 OFFICE 10% Transit Reduction</i>  |                 | 178             | 23                          | 3         | 5          | 23         |
| <i>Ph6 OFFICE 10% Transit Reduction</i>  |                 | 249             | 32                          | 5         | 6          | 32         |
| <b>Total Traffic (reduced)</b>           |                 | <b>934</b>      | <b>90</b>                   | <b>43</b> | <b>38</b>  | <b>94</b>  |
| <b>Total DHV (reduced)</b>               |                 |                 | <b>133</b>                  |           | <b>132</b> |            |

TABLE 8 -- ACCESS DESIGN HOURLY VOLUME BY PHASE

| Phase         | Weekday Design Hour Traffic |        |       |        |
|---------------|-----------------------------|--------|-------|--------|
|               | AM IN                       | AM OUT | PM IN | PM OUT |
| Phase 3/4/5/7 | 26                          | 17     | 9     | 31     |
| Phase 6       | 32                          | 5      | 6     | 32     |
| Phase 8       | 1                           | 0      | 0     | 1      |
| Phase 9       | 31                          | 21     | 23    | 30     |

The trip distribution and assignment at the RFTA / P&R and Wulfsohn Road intersection is provided in Appendix F.

### 5.3 Total RFTA Traffic Intersection Capacity Analysis

The Total RFTA traffic volumes are shown in Appendix A. Table 9 shows the overall LOS results of the capacity analysis for the study intersections for the 2043 Total RFTA Ultimate traffic scenario. The study intersections operate at an overall LOS C or better.

MOE analysis is also presented in Table 9 and provides an overview of intersection approach movements to understand the effect of RFTA Ultimate traffic volumes in addition to the 2043 Background traffic. All intersection approach movements operate at LOS C or better except for those highlighted in the table, further summary is provided below.

#### Wulfsohn Rd. and RFTA / P&R (#20)

The project intersection operates at overall LOS A and all approach movements operate at LOS B or better in both scenarios. Expected 95<sup>th</sup> percentile queue lengths are within existing storage lengths.

#### Midland Ave. and Wulfsohn Rd. (#4)

The NB approach operates at LOS D (E) in the 2043 Background scenario, the RFTA ultimate buildout traffic degrades the operation to LOS (E) F. The 95<sup>th</sup> percentile queue analysis shows a length of 66 (82) ft in the 2043 Background scenario and increases to 134 (239) ft queue length with the RFTA ultimate buildout traffic.

TABLE 9 - TOTAL RFTA - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2043 Background |               |     |       |                  | 2043 Background + RFTA |               |     |       |                  |
|---------------------------------------|-------------------|----|-----------------------------------|-----------------|---------------|-----|-------|------------------|------------------------|---------------|-----|-------|------------------|
|                                       |                   |    |                                   | Overall LOS     | Overall Delay | LOS | Delay | 95th % Q (L_T_R) | Overall LOS            | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A               | 2.2           | A   | 7.5   | 7                | A                      | 3.6           | A   | 7.6   | 19               |
|                                       |                   | PM |                                   | A               | 2.7           | A   | 7.3   | 4                | A                      | 4.9           | A   | 7.4   | 14               |
|                                       | WB L              | AM | 1500**                            |                 |               | A   | 7.3   | 6                |                        |               | A   | 7.5   | 15               |
|                                       |                   | PM |                                   |                 |               | A   | 7.3   | 2                |                        |               | A   | 7.4   | 7                |
|                                       | NB R              | AM | 334**                             |                 |               | A   | 8.5   | 23               |                        |               | A   | 8.7   | 35               |
|                                       |                   | PM |                                   |                 |               | A   | 8.7   | 22               |                        |               | A   | 8.8   | 42               |
|                                       | NB T/L            | AM | 334**                             |                 |               | B   | 10.1  | 41               |                        |               | B   | 12    | 50               |
|                                       |                   | PM |                                   |                 |               | A   | 9.8   | 40               |                        |               | B   | 11.1  | 55               |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | A               | 1.4           | A   | 8.4   | 31_0_28          | A                      | 2.6           | A   | 8.4   | 32_16_38         |
|                                       |                   | PM |                                   | A               | 2.6           | B   | 10.3  | 14_8_31          | A                      | 8.6           | B   | 10.3  | 17_10_35         |
|                                       | WB L              | AM | 95_1350                           |                 |               | B   | 11.1  | 6_2              |                        |               | B   | 11.4  | 24_9             |
|                                       |                   | PM |                                   |                 |               | A   | 8.6   | 20_17            |                        |               | A   | 8.7   | 20_24            |
|                                       | NB                | AM | 825                               |                 |               | D   | 32.8  | 66               |                        |               | E   | 43.5  | 134              |
|                                       |                   | PM |                                   |                 |               | E   | 39.4  | 82               |                        |               | F   | 88    | 239              |
|                                       | SB T/L            | AM | 327                               |                 |               | D   | 27.6  | 32               |                        |               | D   | 29.2  | 32               |
|                                       |                   | PM |                                   |                 |               | C   | 24.3  | 40               |                        |               | C   | 24.8  | 41               |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | B               | 12.1          | B   | 11.1  | 97               | C                      | 15.9          | B   | 13.5  | 191              |
|                                       |                   | PM |                                   | B               | 10.8          | B   | 11.5  | 166              | B                      | 12.1          | B   | 13.4  | 186              |
|                                       | WB                | AM | 226                               |                 |               | B   | 13.7  | 146              |                        |               | C   | 19.6  | 157              |
|                                       |                   | PM |                                   |                 |               | B   | 10.9  | 105              |                        |               | B   | 11.8  | 106              |
|                                       | NB                | AM | 404                               |                 |               | A   | 9.8   | 53               |                        |               | B   | 10.8  | 61               |
|                                       |                   | PM |                                   |                 |               | A   | 9.5   | 72               |                        |               | B   | 10.2  | 79               |
|                                       | SB                | AM | 398                               |                 |               | A   | 9.5   | 55               |                        |               | B   | 10.3  | 63               |
|                                       |                   | PM |                                   |                 |               | A   | 9.5   | 60               |                        |               | A   | 9.9   | 71               |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A               | 9.1           | A   | 8.3   | 54               | A                      | 9.6           | A   | 8.5   | 57               |
|                                       |                   | PM |                                   | A               | 8.1           | A   | 8     | 53               | A                      | 8.2           | A   | 8.1   | 56               |
|                                       | WB                | AM | 211                               |                 |               | A   | 8.2   | 63               |                        |               | A   | 8.5   | 62               |
|                                       |                   | PM |                                   |                 |               | A   | 7.9   | 60               |                        |               | A   | 8     | 60               |
|                                       | NB                | AM | 418                               |                 |               | A   | 8     | 16               |                        |               | A   | 8.1   | 21               |
|                                       |                   | PM |                                   |                 |               | --  | --    | --               |                        |               | --  | --    | --               |
|                                       | SB                | AM | 404                               |                 |               | A   | 9.7   | 79               |                        |               | B   | 10.4  | 79               |
|                                       |                   | PM |                                   |                 |               | A   | 8.4   | 52               |                        |               | A   | 8.6   | 51               |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | B               | 10.5          | D   | 41.7  | 72               | B                      | 17.4          | E   | 72.7  | 85               |
|                                       |                   | PM |                                   | C               | 23.2          | E   | 76.1  | 95               | C                      | 23.9          | E   | 75    | 98               |
|                                       | EB T/R            | AM | 211                               |                 |               | D   | 45.4  | 83               |                        |               | F   | 88.7  | 127              |
|                                       |                   | PM |                                   |                 |               | F   | 80.3  | 120              |                        |               | F   | 81.3  | 138              |
|                                       | WB L              | AM | 75                                |                 |               | D   | 43.3  | 58               |                        |               | E   | 75.8  | 74               |
|                                       |                   | PM |                                   |                 |               | E   | 71.5  | 104              |                        |               | E   | 71.3  | 91               |
|                                       | WB T/R            | AM | 277                               |                 |               | D   | 45.2  | 70               |                        |               | E   | 79.4  | 88               |
|                                       |                   | PM |                                   |                 |               | F   | 97.3  | 222              |                        |               | F   | 97.3  | 200              |
|                                       | NB L              | AM | 150                               |                 |               | A   | 7.3   | 147              |                        |               | A   | 8.1   | 137              |
|                                       |                   | PM |                                   |                 |               | A   | 8.1   | 144              |                        |               | A   | 8.5   | 151              |
|                                       | NB TT/R           | AM | 433_433                           |                 |               | B   | 12.7  | 306_261          |                        |               | B   | 11.2  | 331_270          |
|                                       |                   | PM |                                   |                 |               | C   | 20.4  | 553_556          |                        |               | C   | 21.1  | 548_554          |
|                                       | SB L              | AM | 125                               |                 |               | A   | 8.9   | 59               |                        |               | A   | 8     | 62               |
|                                       |                   | PM |                                   |                 |               | B   | 17.8  | 73               |                        |               | B   | 18.4  | 81               |
|                                       | SB TT/R           | AM | 412_412                           |                 |               | A   | 1.5   | 218_213          |                        |               | B   | 11.4  | 290_272          |
|                                       |                   | PM |                                   |                 |               | B   | 11.7  | 264_251          |                        |               | B   | 12.2  | 263_247          |

1 – Delay expressed as average delay per vehicle in seconds/vehicle

**9<sup>th</sup> St. and Grand Ave. (#16):**

In the 2043 Background scenario, the EB and WB approach movements operate at LOS D or worse. The addition of the RFTA ultimate buildout traffic degrades the operation to LOS E or worse. The intersection still maintains an acceptable overall LOS B (C). The 95<sup>th</sup> percentile queue analysis indicates that the WB and EB left turns exceed the existing storage lengths in both the 2043 Background and 2043 RFTA ultimate buildout scenario.

**5.4 Total RFTA Traffic Auxiliary Turn Lane Analysis**

Auxiliary turn lane requirements for access to Colorado State Highways and many local roadways are determined using the State Highway Access Code (SHAC) and based on the projected DHVs, the speed limit and geometry of the highway adjacent to the access, and the classification of the highway. The City uses the SHAC as the standard for determining the need for auxiliary lanes.

**5.4.1 Wulfsohn Rd. and RFTA GMF/Park and Ride (#20)**

For design purposes, the speed limit of Wulfsohn Rd. adjacent to the project is 25 mph in both directions.

Based on the SHAC 3.12 for a Category NR-C - Non-Rural Arterial, auxiliary turn lanes shall be installed according to the criteria below:

- a. A left turn lane with taper and storage length is required for any access with a projected peak hour left ingress turning volume greater than 25 vph. No deceleration length is required.
  - o *WB left volume 41 vph - Lane warranted*
  - o *EB left volume 21 vph - Lane not warranted*
  - o Storage Length = 50 ft; For reference; using a passenger vehicle length of 20 ft (A bus equals two passenger vehicles, a semi-trailer equals 3 passenger vehicles). The 50 ft length has the following capacity: 2 passenger vehicles, or 1 bus.
- b. A right turn deceleration lane and taper length is required for any access with a projected peak hour right ingress turning volume greater than 50 vph. No deceleration length is required.
  - o *WB right volume: 39 vph - Lane not warranted*
  - o *EB right volume: 33 vph - Lane not warranted*

**TABLE 10 - WULFSOHN / RFTA INTERSECTION AUXILIARY LANE REQUIREMENTS**

| Auxiliary Lane<br>(11 ft width) | Standard Code Design<br>Length + Storage (taper)<br>(ft) | DHV<br>(vph) | Posted<br>Speed<br>(mph) | Storage<br>(ft) | 95th % Q<br>(ft) |
|---------------------------------|----------------------------------------------------------|--------------|--------------------------|-----------------|------------------|
| EB Left Turn                    | --                                                       | 21           | 25                       | --              | 19               |
| WB Left Turn                    | 0 + 50 (90)                                              | 41           | 25                       | 50              | 31               |

The SHAC provides the following design parameters for redirect tapers:

- a. The WB redirect taper is located within a 25-mph speed zone and should have a taper rate of 15:1.

**5.4.2 Midland Ave. and Wulfsohn Rd. (#4)**

For design purposes, the speed limit of Midland Ave. at the intersection with Wulfsohn Rd. is 25 mph in both directions.

Based on the SHAC for a Category NR-C - Non-Rural Arterial, auxiliary turn lanes shall be installed according to the criteria below:

- a. A left turn lane with taper and storage length is required for any access with a projected peak hour left ingress turning volume greater than 25 vph. No deceleration length is required.
  - o *WB left volume 7 vph - Lane not warranted*
  - o *EB left volume 31 vph - Lane warranted*
  - o Storage Length = 40 ft; A 40 ft length has the following capacity: 2 passenger vehicles, or 1 bus.
- b. A right turn deceleration lane and taper length is required for any access with a projected peak hour right ingress turning volume greater than 50 vph. No deceleration length is required.
  - o *WB right volume: 19 vph - Lane not warranted*
  - o *EB right volume: 133 vph - Lane warranted*
  - o Storage Length = 150 ft; A 150 ft. length has the following capacity: 7 passenger vehicles, 1 bus and 5 passenger vehicles, or 1 semi-truck and 4 passenger vehicles.

TABLE 11 - MIDLAND / WULFSOHN INTERSECTION AUXILIARY LANE REQUIREMENTS

| Auxiliary Lane<br>(12 ft width) | Existing Condition<br>Storage (taper) (ft) | Standard Code Design<br>Storage (taper) (ft) | DHV<br>(vph) | Posted<br>Speed<br>(mph) | Storage<br>required<br>(ft) | 95th % Q<br>(ft) |
|---------------------------------|--------------------------------------------|----------------------------------------------|--------------|--------------------------|-----------------------------|------------------|
| EB Left Turn                    | 95 + (70)                                  | 40 + (90)                                    | 31           | 25                       | --                          | 19               |
| EB Right Turn                   | 25 + (75)                                  | 150 + (90)                                   | 133          | 25                       | <b>125</b>                  | 47               |
| WB Left Turn                    | 95 + (70)                                  | --                                           | 7            | 25                       | --                          | 24               |

The State Access Code gives the following design parameters for redirect tapers:

- a. Both redirect tapers are located within a 25-mph speed zone and should have a taper rate of 15:1

The existing EB Left Turn storage bay distance of 95 ft. is sufficient. The existing EB Right Turn storage bay has a length of 25 ft and requires an additional 125 ft. to meet the SHAC Auxiliary Lane Requirements.

## 5.5 Wulfsohn Rd. and RFTA GMF/Park and Ride - Access Assessment

The existing project intersection is a two-way stop-controlled intersection with Wulfsohn Road uncontrolled and stop signs on the north and south approaches. This access lies within a tangent section of Wulfsohn Road. Both the NB and SB approaches are able to provide adequate entering sight distance for a Multi-Unit Truck and Bus, with available sight distance of 425 ft based on the 25-mph posted speed. Consideration needs to be given to the street trees on the south side of Wulfsohn to maintain vision for NB traffic through the required sight triangle. The 85<sup>th</sup> percentile speed on west Wulfsohn as reported in the GMMTS is approximately 35 mph and would require an entering sight distance of 595 ft. The SB approach provides this additional sight distance. The NB approach can provide a maximum distance of 475 ft with attention to tree trimming within the sight triangle of the street trees on the south side of Wulfsohn Road, sight distance beyond that is limited by the horizontal and vertical roadway geometry. Photographs of the existing access conditions are provided below.





FIGURE 5 - RFTA GMF NB APPROACH AT WULFSOHN ROAD (W / E)



FIGURE 6 - RFTA P&amp;R SB APPROACH AT WULFSOHN ROAD (E / W)

The buildout of the RFTA GMF will result in an increase in both vehicular and pedestrian volumes at the Wulfsohn Road project intersection. The CDOT Pedestrian Crossing Guidelines provide guidance for the installation of crosswalks and appropriate treatments based on location, volumes, and roadway type.

Based on the future vehicular traffic on Wulfsohn Road, up to 5000 ADT, and increased pedestrian volumes with the addition of the administration building, employee housing, and park and ride expansion, the installation of a pedestrian crosswalk is recommended. The painted crosswalk should be located on the west side of the Wulfsohn Road intersection as shown in Figure 7. The crosswalk should be installed with warning signage per the MUTCD consisting of a W11-2 pedestrian crossing sign with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a W11-2 advanced pedestrian warning sign. Guidelines and calculations are provided in the Appendix.



FIGURE 7 - RFTA P&amp;R / GMF AT WULFSOHN ROAD - PEDESTRIAN CROSSING

### 5.6 State Highway Access Permit Evaluation

Based on the SHAC, an access permit is required when a change of greater than 20% occurs when accessing a state highway. Because there is not an existing permit for I-70 Exit #114, CDOT has directed to use the 2022 Existing Adjusted traffic volumes from the K-H GMMTS as the permit threshold, those volumes are calculated in Appendix F shown in Table 12. The table also presents the percentage of DHV added to the Exit #114 Interchange by the RFTA ultimate buildout scenario. The RFTA total traffic falls below the 20% threshold that requires a CDOT Access Permit.

TABLE 12 - RFTA DHV AND 2022 I-70 DHV %

| RFTA              | HOUR | DHV   | % 2023 |
|-------------------|------|-------|--------|
|                   |      |       | DHV    |
| TOTAL             | AM   | 82    | 6.0%   |
| ULTIMATE BUILDOUT | PM   | 94    | 6.3%   |
| 2023 DHV          |      |       |        |
|                   | AM   | 1,359 |        |
|                   | PM   | 1,493 |        |

### 5.7 Total RFTA Traffic - Summary of Conclusions

The analysis of the combined 2043 Background traffic and the RFTA ultimate buildout traffic presented above results in the following conclusions.

- The degradation of LOS at the Midland and Wulfsohn intersection is partially the result of the RFTA ultimate buildout traffic. In terms of percentages, the RFTA share of the volume is as follows.
  - 42% of 2023 Baseline DHV
  - 20% of 2043 Total GM-RFTA DHV



- Improvement of the Midland and Wulfsohn intersection is needed prior to RFTA ultimate buildout or the NB approach LOS will degrade to LOS E/F with up to 250 ft 95<sup>th</sup> percentile queue lengths.
- Depending on timing of potential Midland and Wulfsohn intersection improvements being implemented, consideration should be given to extending the existing EB right turn lane an additional 125 ft, for a total of 150 ft.
- The RFTA ultimate buildout volumes warrant a WB left turn lane from Wulfsohn to the RFTA GMF access driveway. Consideration should be given to providing the corresponding EB left turn lane to the RFTA Park and ride lot which is just under the warrant volume (21 v 25 vph)
- The future development of the residential units and/or additional park and ride spaces should include a consideration for a two-lane SB approach to Wulfsohn Road to help alleviate potential SB queuing issues across the existing park and ride lot access aisle.
- At the NB approach to Wulfsohn, RFTA should work with the City to trim and/or remove trees to provide the maximum sight distance possible with existing geometric limitations (~475 ft).
- At the west side of the Wulfsohn Road project intersection, a painted crosswalk should be installed with warning signage per the MUTCD consisting of a W11-2 pedestrian crossing sign with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a W11-2 advanced pedestrian warning sign.
- The RFTA ultimate buildout traffic does not trigger a CDOT Access Permit at Exit 114

## 6.0 Total GM+RFTA Traffic (2043) - Background plus GM Developed plus RFTA

### 6.1 Glenwood Meadows Trip Generation and Assignment

The RFTA (Zone 5) traffic was calculated based on the volume and distribution in the GMMTS. Subtracting the Zone 5 trip assignment volumes from the fully developed GMMTS assignment (GMMTS Figure 11) results in the Glenwood Meadows traffic distribution less RFTA (Zone 5) traffic. Adding this to the previous 2043 Background plus RFTA ultimate buildout scenario results in the 2043 Total Traffic, which includes background traffic and fully developed RFTA and Glenwood Meadows Traffic. The Total GM+RFTA traffic volumes are shown in Appendix A.

### 6.2 Total GM + RFTA Traffic Intersection Capacity Analysis

Table 13 shows the overall LOS results of the capacity analysis for the study intersections for the Total GM+RFTA traffic scenario. The Midland and Wulfsohn and 8<sup>th</sup> Street and Colorado Ave intersections overall LOS degrade to LOS E(F) and LOS D(D) respectively when the GM 2040 traffic is added to the 2043 Background plus RFTA ultimate buildout scenario. The remaining study intersections continue to operate at overall LOS C or better.

MOE analysis is also presented in Table 13 and provides an overview of intersection approach movements for Total GM+RFTA scenario to understand the effect of Glenwood Meadows traffic volumes in addition to the Total RFTA traffic. All intersection approach movements operate at LOS C or better except for those highlighted in the table and summarized below.

#### **Wulfsohn Rd. and RFTA / P&R (#20)**

The project intersection operates at overall LOS A and all approach movements operate at LOS C or better in both scenarios. The 95<sup>th</sup> percentile queue lengths are affected by the queuing that occurs at the Wulfsohn NB approach to Midland, which queues through this intersection and results in side street queuing. A solution to the future capacity issues at the Midland and Wulfsohn intersection will result in acceptable operation and queuing at this location.

#### **Midland Ave. and Wulfsohn Rd. (#4)**

The NB approach operates at LOS F during both design hours in the Total GM + RFTA scenario. The 95<sup>th</sup> percentile queue analysis results in approximately 1000 ft of queuing that extends through the Wulfsohn Road project intersection. The capacity issue can be resolved with the implementation of either a traffic signal or roundabout at this location. The GMMTS recommended implementing signal control, or alternatively a two-lane roundabout, at this intersection to alleviate the LOS and queueing issues with 2030 traffic volume projections.

The GMMTS traffic signal analysis maintained the same intersection geometry with permissive-only left turn phasing on all four approaches and a cycle length of 90 seconds, which improved the AM and PM overall LOS to B and C, respectively. The 95<sup>th</sup> queue lengths were reported on the order of 300-400 ft, at least 400 ft clear of (and west of) the project intersection.

A two-lane roundabout was initially discarded as a feasible alternative in the GMMTS, but further preliminary analysis by SGM found that the 2040 Traffic volumes may be acceptable for a roundabout that could fit the topography of the site. (See SGM Memorandum dated 4/27/2023).

TABLE 13 - TOTAL GM+RFTA - OVERALL LOS AND MOE BY MOVEMENT SUMMARY

| Intersection                          | Approach Movement |    | Link/Storage Bay Distance (L_T_R) | 2043 Background + RFTA |               |     |       |                  | 2043 Background + GM + RFTA |               |     |       |                  |
|---------------------------------------|-------------------|----|-----------------------------------|------------------------|---------------|-----|-------|------------------|-----------------------------|---------------|-----|-------|------------------|
|                                       |                   |    |                                   | Overall LOS            | Overall Delay | LOS | Delay | 95th % Q (L_T_R) | Overall LOS                 | Overall Delay | LOS | Delay | 95th % Q (L_T_R) |
| #20 Wulfsohn Rd. and RFTA / PnR       | EB L              | AM | 825                               | A                      | 3.6           | A   | 7.6   | 19               | A                           | 2.7           | A   | 8     | 16               |
|                                       |                   | PM |                                   | A                      | 4.9           | A   | 7.4   | 14               | A                           | 3.4           | A   | 7.7   | 15               |
|                                       | WB L              | AM | 1500**                            |                        |               | A   | 7.5   | 15               |                             |               | A   | 7.7   | 2015             |
|                                       |                   | PM |                                   |                        |               | A   | 7.4   | 7                |                             |               | A   | 7.8   | 1493             |
|                                       | NB R              | AM | 334**                             |                        |               | A   | 8.7   | 35               |                             |               | A   | 9.2   | 134              |
|                                       |                   | PM |                                   |                        |               | A   | 8.8   | 42               |                             |               | A   | 9.8   | 275              |
|                                       | NB T/L            | AM | 334**                             |                        |               | B   | 12    | 50               |                             |               | C   | 15.9  | 329              |
|                                       |                   | PM |                                   |                        |               | B   | 11.1  | 55               |                             |               | C   | 15.9  | 438              |
|                                       | SB                | AM | 254**                             |                        |               | B   | 10.8  | 45               |                             |               | B   | 13.3  | 230              |
|                                       |                   | PM |                                   |                        |               | B   | 10    | 56               |                             |               | B   | 12.6  | 329              |
| #4 - Midland Avenue and Wulfsohn Road | EB L              | AM | 95_776_25                         | A                      | 2.6           | A   | 8.4   | 32_16_38         | E                           | 47.1          | A   | 8.5   | 35_17_47         |
|                                       |                   | PM |                                   | A                      | 8.6           | B   | 10.3  | 17_10_35         | F                           | 97.8          | B   | 10.9  | 44_16_46         |
|                                       | WB L              | AM | 95_1350                           |                        |               | B   | 11.4  | 24_9             |                             |               | B   | 11.9  | 27_6             |
|                                       |                   | PM |                                   |                        |               | A   | 8.7   | 20_24            |                             |               | A   | 9.1   | 24_20            |
|                                       | NB                | AM | 825                               |                        |               | E   | 43.5  | 134              |                             |               | F   | 367.2 | 953              |
|                                       |                   | PM |                                   |                        |               | F   | 88    | 239              |                             |               | F   | 718.9 | 976              |
|                                       | SB T/L            | AM | 327                               |                        |               | D   | 29.2  | 32               |                             |               | D   | 34.3  | 41               |
|                                       |                   | PM |                                   |                        |               | C   | 24.8  | 41               |                             |               | E   | 35.9  | 72               |
|                                       | SB R              | AM | 75                                |                        |               | B   | 11    | 24               |                             |               | B   | 11.3  | 34               |
|                                       |                   | PM |                                   |                        |               | C   | 18.7  | 56               |                             |               | C   | 21.9  | 73               |
| #13 8th St. and Colorado Ave.         | EB                | AM | 218                               | C                      | 15.9          | B   | 13.5  | 191              | D                           | 31.7          | D   | 37.2  | 240              |
|                                       |                   | PM |                                   | B                      | 12.1          | B   | 13.4  | 186              | D                           | 27.7          | D   | 31.7  | 228              |
|                                       | WB                | AM | 226                               |                        |               | C   | 19.6  | 157              |                             |               | E   | 37.2  | 188              |
|                                       |                   | PM |                                   |                        |               | B   | 11.8  | 106              |                             |               | D   | 29.7  | 169              |
|                                       | NB                | AM | 404                               |                        |               | B   | 10.8  | 61               |                             |               | B   | 12.2  | 64               |
|                                       |                   | PM |                                   |                        |               | B   | 10.2  | 79               |                             |               | B   | 12.3  | 76               |
|                                       | SB                | AM | 398                               |                        |               | B   | 10.3  | 63               |                             |               | B   | 11.6  | 63               |
|                                       |                   | PM |                                   |                        |               | A   | 9.9   | 71               |                             |               | B   | 11.8  | 69               |
| #15 9th St. and Colorado Ave.         | EB                | AM | 501                               | A                      | 9.6           | A   | 8.5   | 57               | A                           | 9.6           | A   | 8.5   | 52               |
|                                       |                   | PM |                                   | A                      | 8.2           | A   | 8.1   | 56               | A                           | 8.2           | A   | 8.1   | 52               |
|                                       | WB                | AM | 211                               |                        |               | A   | 8.5   | 62               |                             |               | A   | 8.5   | 66               |
|                                       |                   | PM |                                   |                        |               | A   | 8     | 60               |                             |               | A   | 8     | 58               |
|                                       | NB                | AM | 418                               |                        |               | A   | 8.1   | 21               |                             |               | A   | 8.1   | 20               |
|                                       |                   | PM |                                   |                        |               | --  | --    | --               |                             |               | --  | --    | --               |
|                                       | SB                | AM | 404                               |                        |               | B   | 10.4  | 79               |                             |               | B   | 10.4  | 78               |
|                                       |                   | PM |                                   |                        |               | A   | 8.6   | 51               |                             |               | A   | 8.6   | 54               |
| #16 9th St. and Grand Ave.            | EB L              | AM | 75                                | B                      | 17.4          | E   | 72.7  | 85               | B                           | 17.4          | E   | 72.7  | 86               |
|                                       |                   | PM |                                   | C                      | 23.9          | E   | 75    | 98               | C                           | 24.8          | E   | 75.3  | 102              |
|                                       | EB T/R            | AM | 211                               |                        |               | F   | 88.7  | 127              |                             |               | F   | 88.7  | 138              |
|                                       |                   | PM |                                   |                        |               | F   | 81.3  | 138              |                             |               | F   | 81.3  | 133              |
|                                       | WB L              | AM | 75                                |                        |               | E   | 75.8  | 74               |                             |               | E   | 75.8  | 76               |
|                                       |                   | PM |                                   |                        |               | E   | 71.3  | 91               |                             |               | E   | 71.3  | 102              |
|                                       | WB T/R            | AM | 277                               |                        |               | E   | 79.4  | 88               |                             |               | E   | 79.4  | 91               |
|                                       |                   | PM |                                   |                        |               | F   | 97.3  | 200              |                             |               | F   | 97.3  | 238              |
|                                       | NB L              | AM | 150                               |                        |               | A   | 8.1   | 137              |                             |               | A   | 8.5   | 132              |
|                                       |                   | PM |                                   |                        |               | A   | 8.5   | 151              |                             |               | A   | 8.8   | 153              |
|                                       | NB TT/R           | AM | 433_433                           |                        |               | B   | 11.2  | 331_270          |                             |               | B   | 11.4  | 341_279          |
|                                       |                   | PM |                                   |                        |               | C   | 21.1  | 548_554          |                             |               | C   | 22.9  | 523_543          |
|                                       | SB L              | AM | 125                               |                        |               | A   | 8     | 62               |                             |               | A   | 8.1   | 57               |
|                                       |                   | PM |                                   |                        |               | B   | 18.4  | 81               |                             |               | C   | 21    | 90               |
|                                       | SB TT/R           | AM | 412_412                           |                        |               | B   | 11.4  | 290_272          |                             |               | B   | 11.8  | 306_287          |
|                                       |                   | PM |                                   |                        |               | B   | 12.2  | 263_247          |                             |               | B   | 12.5  | 289_274          |

1 - Delay expressed as average delay per vehicle in seconds/vehicle

**8<sup>th</sup> St. and Colorado Ave. (#13):**

The addition of the 2040 Glenwood Meadows traffic degrades LOS from B (C) to LOS D (D), still an acceptable LOS for the City. The 95<sup>th</sup> percentile queue analysis results in a 20–25% increase in lengths for the EB / WB movements heading to and from Grand Ave.

**6.3 Total GM+RFTA Traffic - Summary of Conclusions**

The analysis of the combined 2043 Background traffic and the GM developed plus RFTA ultimate buildout traffic presented above results in the following conclusions.

- The degradation of LOS at the Midland and Wulfsohn intersection is worsened by the addition of the 2040 GM traffic volumes.
- Recommendations in the GMMTS should be used for the downtown intersections.

**7.0 Transportation Demand Management Strategies**

Transportation demand management (TDM) is a set of strategies designed at maximizing traveler choices. *Managing demand is about providing travelers, regardless of whether they drive alone, with travel choices, such as work location, route, time of travel and mode. In the broadest sense, demand management is defined as providing travelers with effective choices to improve travel reliability.*<sup>1</sup>

RFTA is in the TDM business. The expansion of the GMF is a primary strategy to help provide future travelers more choices with expanded schedule, reduced travel times, and reliability. The approach to add office space, employee housing, and additional park and ride spaces at this transit hub is an effective land-use strategy. The planned development will serve to provide additional choices for live / work location for management, maintenance, and driver employees; while also serving to reduce vehicle miles traveled and trips. Both have benefits of reducing overall pollutants caused by vehicle emissions.

<sup>1</sup>FHWA, Mitigating Traffic Congestion-The Role of Demand-Side Strategies, prepared by ACT, Report No. FHWA-HOP-05-001, October 2004.

**8.0 Conclusions and Proposed Mitigation Measures****8.1 Summary of Conclusions**

- The Midland and Wulfsohn intersection will need improvement to accommodate the combination of 2023 existing, future background, and Glenwood Meadows / RFTA traffic volumes. In terms of percentages, the RFTA share of the volume at Midland and Wulfsohn intersection is as follows.
  - 42% of 2023 Baseline DHV
  - 20% of 2043 Total GM-RFTA DHV
- The RFTA ultimate buildout traffic does not trigger a CDOT Access Permit at Exit 114
- Except for the Midland and Wulfsohn and project access intersection, the remaining study intersections will operate acceptably in their existing configurations considering the Total RFTA ultimate buildout traffic.

## 8.2 Proposed Mitigation Measures

- Depending on timing of potential Midland and Wulfsohn intersection improvements being implemented, consideration should be given to extending the existing EB right turn lane and additional 125 ft, for a total of 150 ft.
- The RFTA ultimate buildout volumes warrant a WB left turn lane from Wulfsohn to the RFTA GMF access driveway. Consideration should be given to providing the corresponding EB left turn lane which is just under the warrant volume (21 v 25 vph)
- The future development of the residential units and/or additional park and ride spaces should include a consideration for a two-lane SB approach to Wulfsohn Road to help alleviate potential SB queuing issues across the existing park and ride lot access aisle.
- At the NB approach to Wulfsohn, RFTA should work with the City to trim and/or remove trees to provide the maximum sight distance possible with existing geometric limitations (~475 ft).
- At the west side of the Wulfsohn Road project intersection, a painted crosswalk should be installed with warning signage per the MUTCD consisting of a W11-2 pedestrian crossing sign with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a W11-2 advanced pedestrian warning sign.

## Appendix A - TRAFFIC VOLUME FIGURES



Figure 5 – 2023 AM Adjusted Existing Peak Volumes (E)

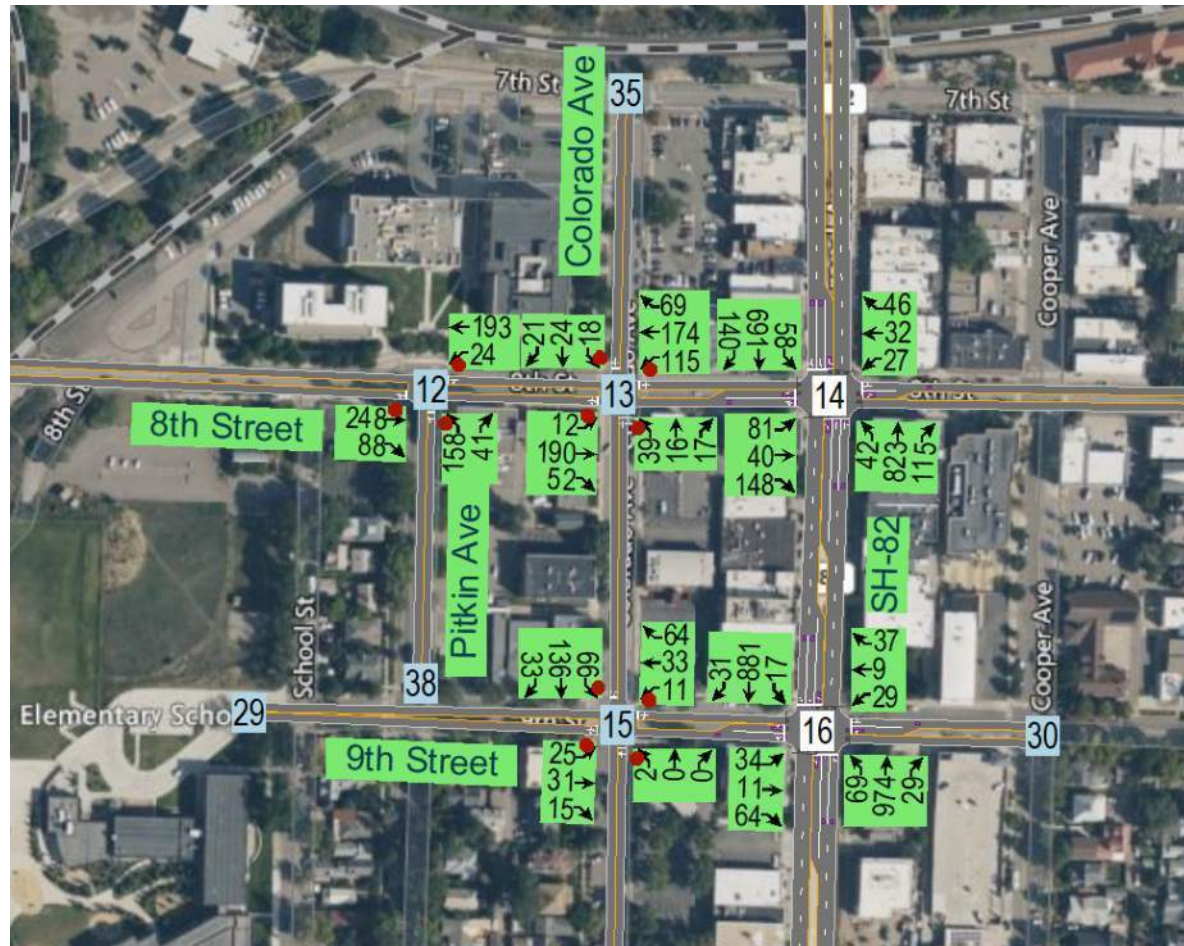


Figure 6 – 2023 AM Adjusted Existing Peak Volumes (W)





Figure 7 – 2023 PM Adjusted Existing Peak Volumes (E)

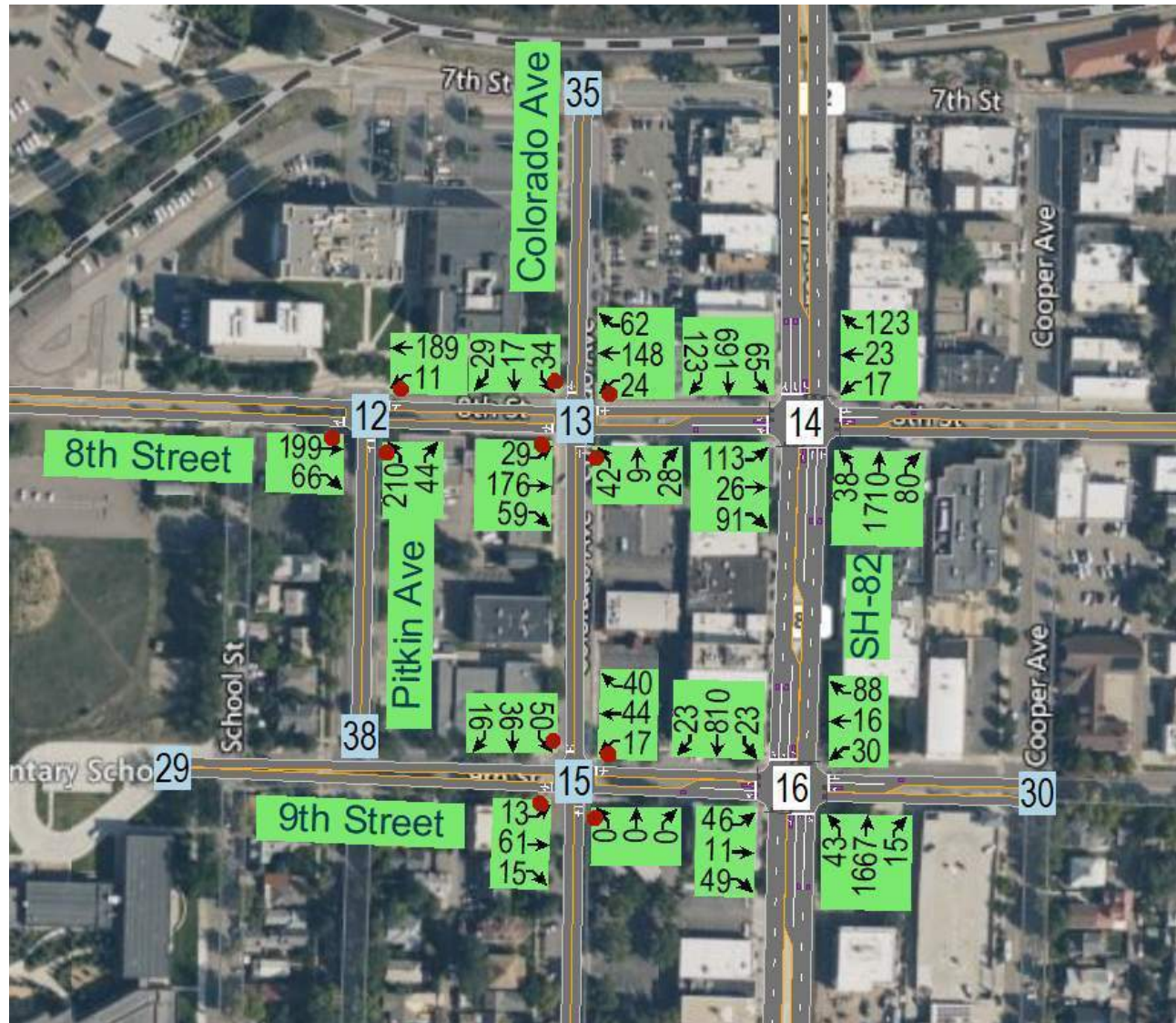


Figure 8 – 2023 PM Adjusted Existing Peak Volumes (W)





Figure 9 – 2043 AM Background Peak Volumes (E)

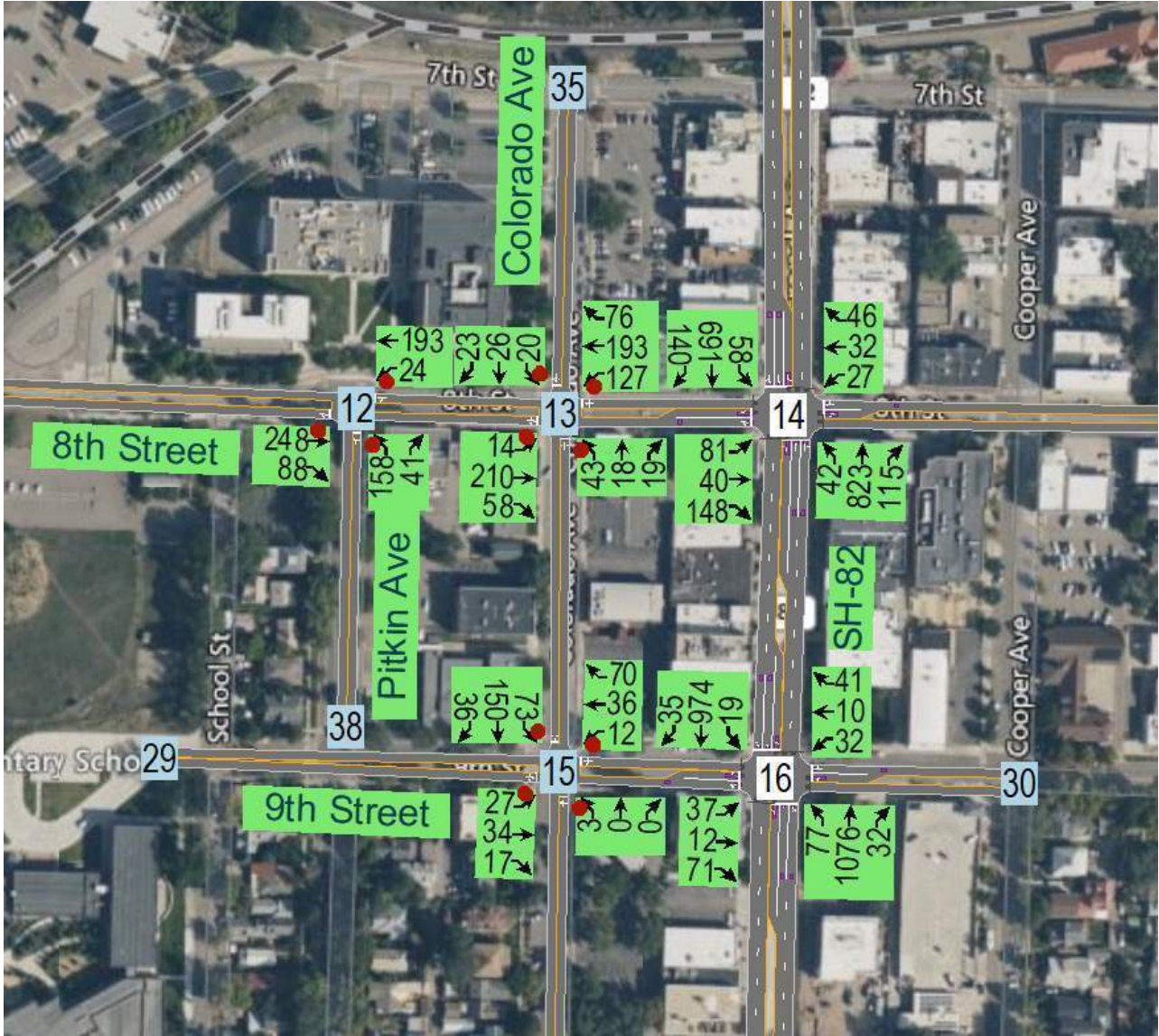


Figure 10 – 2043 AM Background Peak Volumes (W)





Figure 11 – 2043 PM Background Peak Volumes (E)

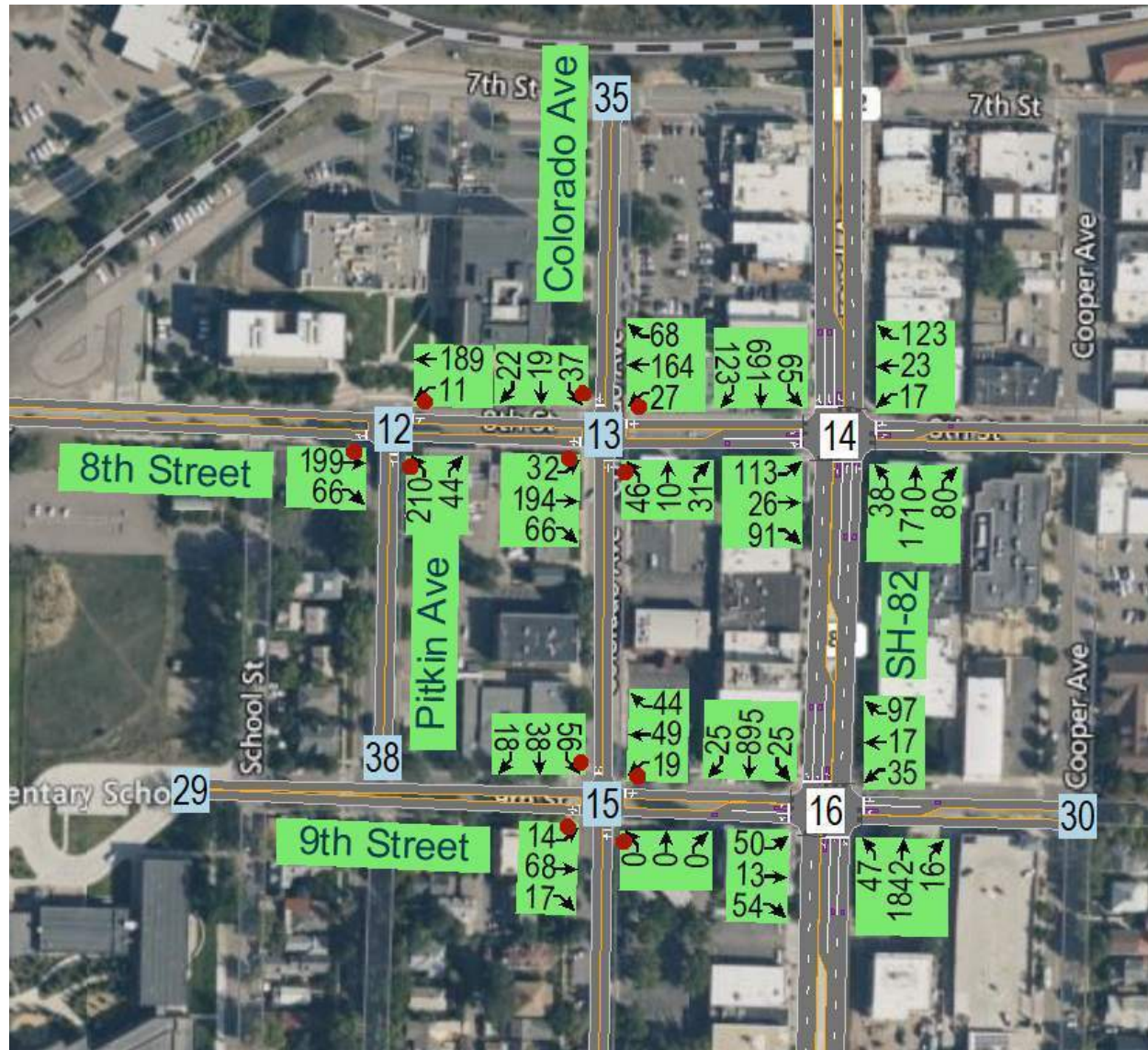






Figure 14 – 2043 AM Background plus RFTA Peak Volumes (E)

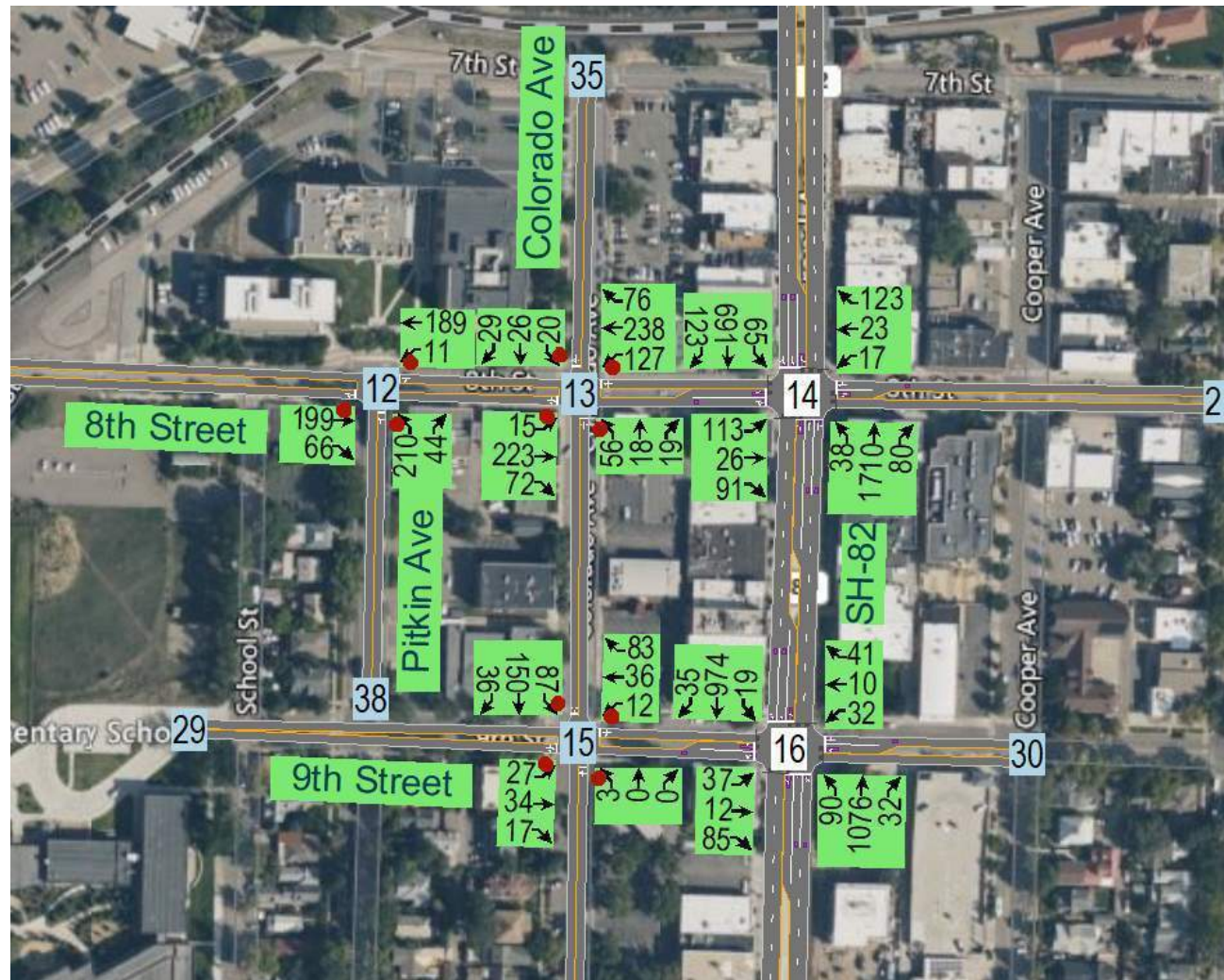


Figure 15 – 2043 AM Background plus RFTA Peak Volumes (W)





Figure 16 – 2043 PM Background plus RFTA Peak Volumes (E)

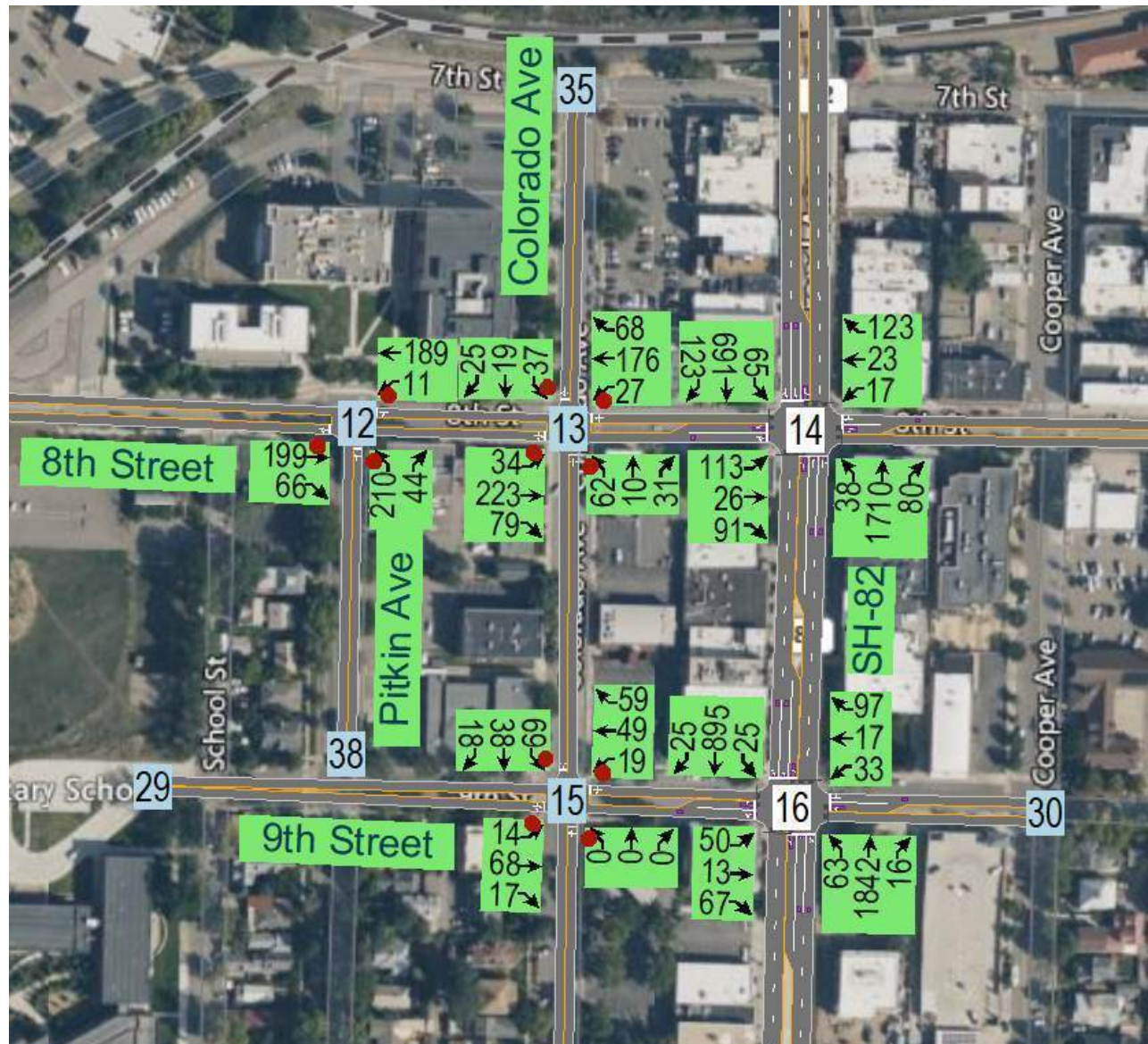




Figure 17 – 2043 PM Background plus RFTA Peak Volumes (W)





Figure 18 – 2043 AM Background plus RFTA plus GM Peak Volumes (E)

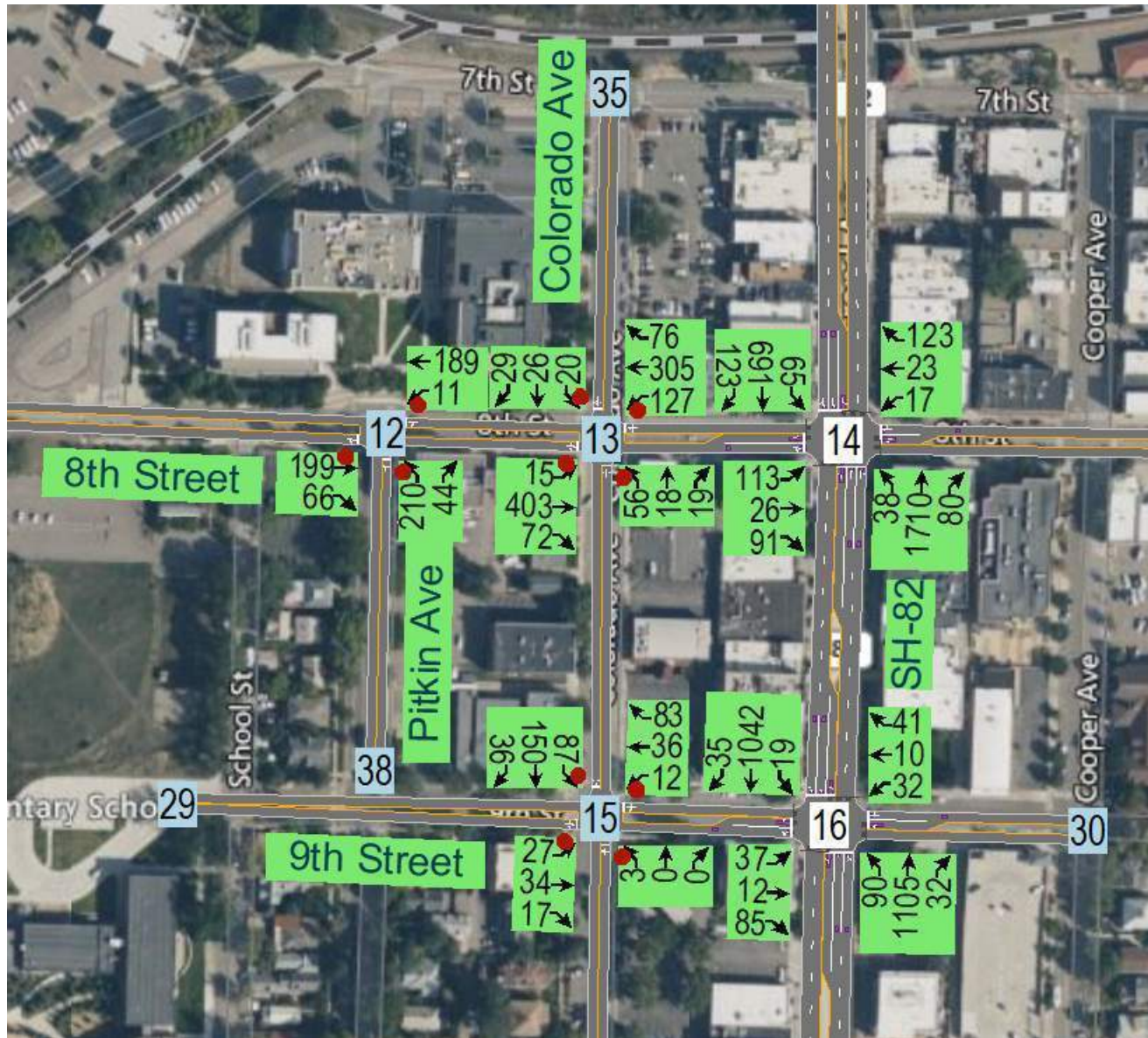




Figure 19 – 2043 AM Background plus RFTA plus GM Peak Volumes (W)





Figure 20 – 2043 PM Background plus RFTA plus GM Peak Volumes (E)

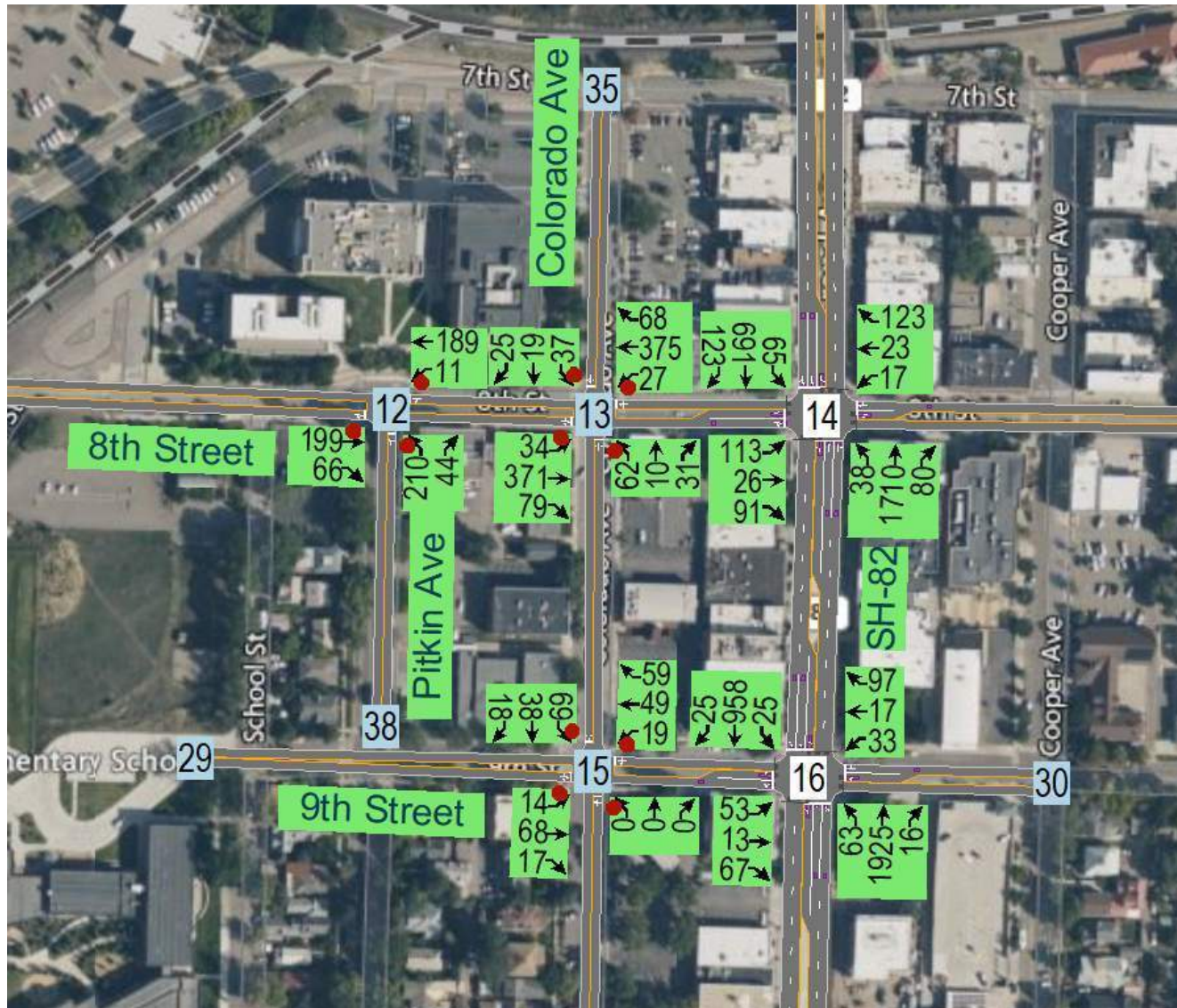




Figure 21 – 2043 PM Background plus RFTA plus GM Peak Volumes (W)



## Appendix B - METHODOLOGY / ASSUMPTIONS (CORRESPONDENCE WITH CoGS)



## MEMORANDUM

**DATE:** *Revised February 20, 2023*

**TO:** Terri Partch, City Engineer, City of Glenwood Springs  
Jessica Bowser, Asst. City Engineer, City of Glenwood Springs

**FROM:** Dan Cokley, PE, PTOE

**RE:** RFTA GMF Level Three Traffic Analysis Methodology Proposal

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A traffic impact study will be prepared using the guidelines of a Colorado Department of Transportation (CDOT) Level Three Traffic Impact Study (TIS) and will satisfy City of Glenwood Springs Engineering Standards Chapter 5.11 Traffic Impact Analysis Standards. The TIS will provide estimates for design hour traffic generation for the RFTA Glenwood Maintenance Facility (GMF) and adjacent Park and Ride lot proposed expansion which is planned to occur in several phases over several years.

This memo documents the methodology and assumptions that SGM intends to use for the RFTA GMF located on the west of Wulfsohn Road in Glenwood Springs, Colorado. The full development of the site and all phasing will be analyzed in this TIS. A summary (to be verified by RFTA prior to TIS) of the future development is provided below.

- Phase 3/4/5/7 - An increase from current operation to a 60-bus option is outlined in this study. 13,100sf of new operations center.
- Phase 6 - 14,400 sf Administration building.
- Phase 8 - 9,600sf Warehouse storage.
- Phase 9 - 74 employee housing units and additional 45-space Park and Ride expansion (total 130-space).

The goal of this memo is to gain the City's acceptance of the data intended for use in the analysis, assumptions proposed for the analysis (directional distribution, trip reduction factors, etc.) and to define the final scope and the overall approach to the TIS.

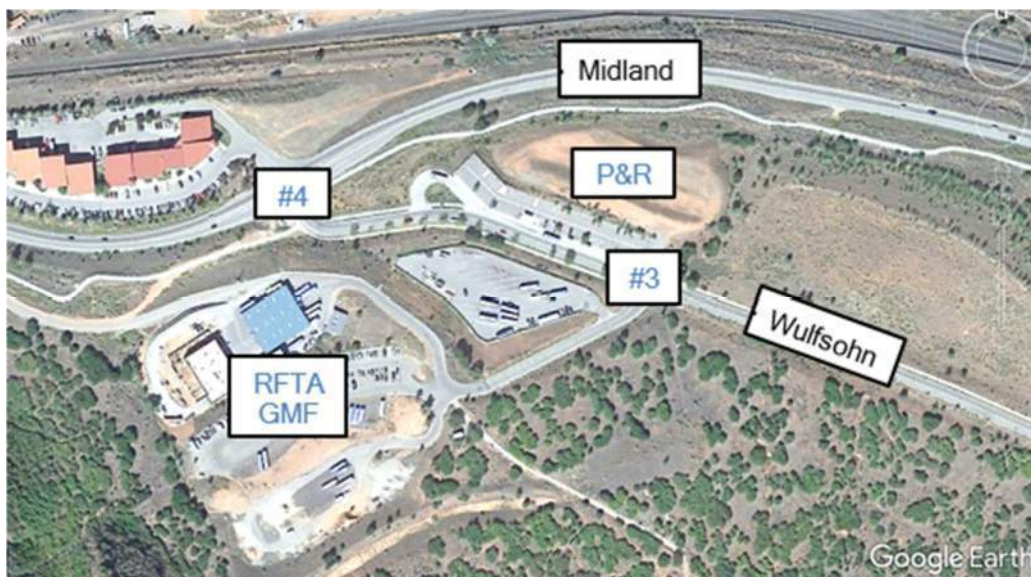


Figure 1 - RFTA GMF / Park and Ride Site Map



## ADD FIGURE 2 - Overall Site Plan (Ultimate Buildout)

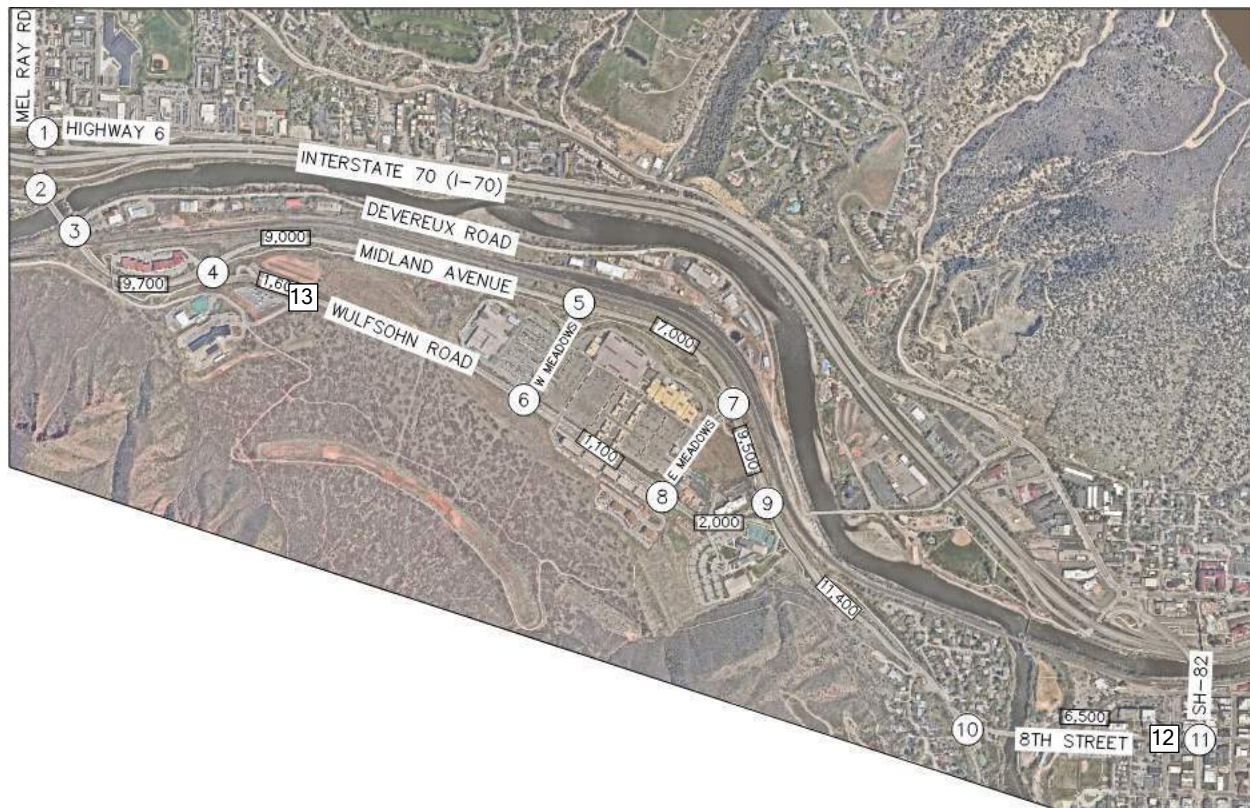
**Background** - We intend to generally use the Glenwood Meadows Master Traffic Study by K-H (GMTS) for future development traffic, distribution and assignment of future traffic, and growth factor beyond the development traffic presented in the GMTS.

**Baseline Traffic** - *The City has had K-H update traffic counts which will be used for this study.*

*New traffic counts will be provided for the following intersections:*

4. Midland and West Wulfsohn
12. 8<sup>th</sup> and Colorado
13. RFTA access and Wulfsohn
14. 9<sup>th</sup> and Colorado
15. 9<sup>th</sup> and Grand

Baseline traffic counts will *NOT* be adjusted using a seasonal factor based on CDOT count station on SH 82 in South Glenwood.



**Figure 3 - RFTA GMF Scoping Map**

**Analysis Years** - Operational analysis of Baseline traffic (2023), 20-year background traffic (2043) and 20-year total traffic (2043) will be completed. Significant and impactful phasing may also warrant additional analysis prior to the 20-year timeframe.

**Development and Growth** - The TIS will input the future development considered in the GMTS for the Glenwood Meadows area, less RFTA (Zone 5) which will be developed in this TIS. This traffic will be distributed and assigned per the GMTS Figure 12. The TIS will use an annual growth rate



of 0.5% applied to volumes outside the immediate Glenwood Meadows travelshed (Intersections a. through e. above and through traffic on Midland Ave).

RFTA Land Use Rates - Trip generation rates from the ITE Trip Generation Manual, 11<sup>th</sup> Edition will be used

- Phase 3/4/5/7 - An increase from current operation to a 60-bus option, 13,100sf of new operations center (office). Use RFTA data for increased buses. General Office Building (Code 710).
- Phase 6 - 14,400 sf Administration building. Use General Office Building (Code 710)
- Phase 8 - 9,600sf Warehouse storage. No additional staffing, no additional trips.
- Phase 9 - 74 employee housing units and additional 45-space Park and Ride expansion (total 130-space). Use Park and Ride (Code 090) and Multi-Family Housing, Mid-rise (Code 221).

RFTA Traffic Distribution - The directional distribution for *RFTA staff and PnR* traffic will match existing travel patterns defined by counts at the RFTA accesses and Wulfsohn Road intersection and downstream intersection distributions. *Existing bus routes at time of GMTS / SGM counts vs future expansion of routes will be analyzed and implemented.*

Access Permits - Evaluation of the need for an Access Permit at Exit #114 and 9<sup>th</sup> / Grand by phase, using GMTS traffic counts.

Operational Analysis - Analysis of the will include intersections 4. - 13. outlined above. LOS, Delay, 95<sup>th</sup> Percentile Queue to be reported for each analysis scenario.

Auxiliary Lane Assessment - The need for auxiliary lanes at the project access intersection will be evaluated per the State Highway Access Code. Wulfsohn is assumed to be a Category NR-C (Non-Rural Arterial). The speed limit in the vicinity of the site is posted at 40 mph.

Multi-modal trip reduction - The location is adjacent to the existing Park and Ride. Given the multi-modal opportunities, a 10% reduction in trips associated with potential future employees (Operations and Administration buildings) and potential future residents (multi-Family housing) is conservatively applied and summarized below.

- Phase 3/4/5/7 - 10% transit reduction applied to office
- Phase 6 - 10% transit reduction applied to office
- Phase 8 - No additional trips.
- Phase 9 - 10% transit reduction applied to housing

*10% reduction will be applied a single time by land use.*

Transportation Demand Strategies - *Review opportunities for management staff, bus drivers, off peak hours.*

## Appendix C - SYNCHRO OUTPUT

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 1.4                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 31                                                                                | 867                                                                               | 86                                                                                | 1                                                                                 | 348                                                                               | 19   | 42   | 0                                                                                 | 4    | 7    | 4                                                                                   | 6                                                                                   |
| Future Vol, veh/h        | 31                                                                                | 867                                                                               | 86                                                                                | 1                                                                                 | 348                                                                               | 19   | 42   | 0                                                                                 | 4    | 7    | 4                                                                                   | 6                                                                                   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                 | 0    | 0    | 0                                                                                   | 0                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88   | 88   | 88                                                                                | 88   | 88   | 88                                                                                  | 88                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 35                                                                                | 985                                                                               | 98                                                                                | 1                                                                                 | 395                                                                               | 22   | 48   | 0                                                                                 | 5    | 8    | 5                                                                                   | 7                                                                                   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 417    | 0 | 0 | 1083   | 0 | 0 | 1469   | 1474  | 985   | 1515   | 1561  | 406   |
| Stage 1              | -      | - | - | -      | - | - | 1055   | 1055  | -     | 408    | 408   | -     |
| Stage 2              | -      | - | - | -      | - | - | 414    | 419   | -     | 1107   | 1153  | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 1142   | - | - | 644    | - | - | 106    | 127   | 301   | 98     | 112   | 645   |
| Stage 1              | -      | - | - | -      | - | - | 273    | 302   | -     | 620    | 597   | -     |
| Stage 2              | -      | - | - | -      | - | - | 616    | 590   | -     | 255    | 272   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 1142   | - | - | 644    | - | - | 101    | 123   | 301   | 94     | 108   | 645   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 203    | 224   | -     | 190    | 206   | -     |
| Stage 1              | -      | - | - | -      | - | - | 265    | 293   | -     | 601    | 596   | -     |
| Stage 2              | -      | - | - | -      | - | - | 604    | 589   | -     | 243    | 264   | -     |

| Approach             | EB  | WB | NB   | SB   |
|----------------------|-----|----|------|------|
| HCM Control Delay, s | 0.3 | 0  | 27.9 | 19.7 |
| HCM LOS              |     |    | D    | C    |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 209   | 1142  | -   | -   | 644   | -   | -   | 196   | 645   |
| HCM Lane V/C Ratio    | 0.25  | 0.031 | -   | -   | 0.002 | -   | -   | 0.064 | 0.011 |
| HCM Control Delay (s) | 27.9  | 8.3   | -   | -   | 10.6  | -   | -   | 24.6  | 10.6  |
| HCM Lane LOS          | D     | A     | -   | -   | B     | -   | -   | C     | B     |
| HCM 95th %tile Q(veh) | 1     | 0.1   | -   | -   | 0     | -   | -   | 0.2   | 0     |

Intersection

Intersection Delay, s/veh 11

Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 12   | 190  | 52   | 115  | 174  | 69   | 39   | 16   | 17   | 18   | 24   | 21   |
| Future Vol, veh/h   | 12   | 190  | 52   | 115  | 174  | 69   | 39   | 16   | 17   | 18   | 24   | 21   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 13   | 207  | 57   | 125  | 189  | 75   | 42   | 17   | 18   | 20   | 26   | 23   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB  | SB  |
|----------------------------|------|------|-----|-----|
| Opposing Approach          | WB   | EB   | SB  | NB  |
| Opposing Lanes             | 1    | 1    | 1   | 1   |
| Conflicting Approach Left  | SB   | NB   | EB  | WB  |
| Conflicting Lanes Left     | 1    | 1    | 1   | 1   |
| Conflicting Approach Right | NB   | SB   | WB  | EB  |
| Conflicting Lanes Right    | 1    | 1    | 1   | 1   |
| HCM Control Delay          | 10.3 | 12.1 | 9.4 | 9.1 |
| HCM LOS                    | B    | B    | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 54%   | 5%    | 32%   | 29%   |
| Vol Thru, %            | 22%   | 75%   | 49%   | 38%   |
| Vol Right, %           | 24%   | 20%   | 19%   | 33%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 72    | 254   | 358   | 63    |
| LT Vol                 | 39    | 12    | 115   | 18    |
| Through Vol            | 16    | 190   | 174   | 24    |
| RT Vol                 | 17    | 52    | 69    | 21    |
| Lane Flow Rate         | 78    | 276   | 389   | 68    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.12  | 0.357 | 0.496 | 0.103 |
| Departure Headway (Hd) | 5.5   | 4.654 | 4.59  | 5.409 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 645   | 768   | 782   | 655   |
| Service Time           | 3.592 | 2.716 | 2.647 | 3.504 |
| HCM Lane V/C Ratio     | 0.121 | 0.359 | 0.497 | 0.104 |
| HCM Control Delay      | 9.4   | 10.3  | 12.1  | 9.1   |
| HCM Lane LOS           | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.4   | 1.6   | 2.8   | 0.3   |



Intersection

Intersection Delay, s/veh 8.8

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 25   | 31   | 15   | 11   | 33   | 64   | 2    | 0    | 0    | 66   | 136  | 33   |
| Future Vol, veh/h   | 25   | 31   | 15   | 11   | 33   | 64   | 2    | 0    | 0    | 66   | 136  | 33   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 27   | 33   | 16   | 12   | 35   | 69   | 2    | 0    | 0    | 71   | 146  | 35   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB | NB  | SB  |
|----------------------------|-----|----|-----|-----|
| Opposing Approach          | WB  | EB | SB  | NB  |
| Opposing Lanes             | 1   | 1  | 1   | 1   |
| Conflicting Approach Left  | SB  | NB | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1  | 1   | 1   |
| Conflicting Approach Right | NB  | SB | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1  | 1   | 1   |
| HCM Control Delay          | 8.1 | 8  | 7.9 | 9.3 |
| HCM LOS                    | A   | A  | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 10%   | 28%   |
| Vol Thru, %            | 0%    | 44%   | 31%   | 58%   |
| Vol Right, %           | 0%    | 21%   | 59%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 2     | 71    | 108   | 235   |
| LT Vol                 | 2     | 25    | 11    | 66    |
| Through Vol            | 0     | 31    | 33    | 136   |
| RT Vol                 | 0     | 15    | 64    | 33    |
| Lane Flow Rate         | 2     | 76    | 116   | 253   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.003 | 0.097 | 0.138 | 0.305 |
| Departure Headway (Hd) | 4.85  | 4.592 | 4.275 | 4.343 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 738   | 781   | 840   | 829   |
| Service Time           | 2.876 | 2.614 | 2.294 | 2.36  |
| HCM Lane V/C Ratio     | 0.003 | 0.097 | 0.138 | 0.305 |
| HCM Control Delay      | 7.9   | 8.1   | 8     | 9.3   |
| HCM Lane LOS           | A     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.3   | 0.5   | 1.3   |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 34                                                                                | 11                                                                                | 64                                                                                | 29                                                                                | 9                                                                                 | 37                                                                                | 69                                                                                  | 974                                                                                 | 29                                                                                  | 17                                                                                  | 881                                                                                 | 31                                                                                  |
| Future Volume (veh/h)         | 34                                                                                | 11                                                                                | 64                                                                                | 29                                                                                | 9                                                                                 | 37                                                                                | 69                                                                                  | 974                                                                                 | 29                                                                                  | 17                                                                                  | 881                                                                                 | 31                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                              | 0.99                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 35                                                                                | 11                                                                                | 65                                                                                | 30                                                                                | 9                                                                                 | 38                                                                                | 70                                                                                  | 994                                                                                 | 30                                                                                  | 17                                                                                  | 899                                                                                 | 32                                                                                  |
| Peak Hour Factor              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 176                                                                               | 22                                                                                | 128                                                                               | 147                                                                               | 24                                                                                | 102                                                                               | 501                                                                                 | 2178                                                                                | 66                                                                                  | 363                                                                                 | 2080                                                                                | 74                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Prop Arrive On Green          | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.04                                                                                | 0.62                                                                                | 0.62                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 42.0                                                                              | 0.0                                                                               | 45.4                                                                              | 43.5                                                                              | 0.0                                                                               | 45.3                                                                              | 6.9                                                                                 | 11.4                                                                                | 11.4                                                                                | 8.2                                                                                 | 1.2                                                                                 | 1.1                                                                                 |
| Ln Grp LOS                    | D                                                                                 | A                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 111                                                                               |                                                                                   |                                                                                   | 77                                                                                |                                                                                   |                                                                                   | 1094                                                                                |                                                                                     |                                                                                     | 948                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 44.3                                                                              |                                                                                   |                                                                                   | 44.6                                                                              |                                                                                   |                                                                                   | 11.1                                                                                |                                                                                     |                                                                                     | 1.3                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.4                                                                               | 66.5                                                                              | 12.8                                                                              | 14.4                                                                              | 8.8                                                                               | 64.1                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.1                                                                               | 40.3                                                                              | 18.1                                                                              | 18.5                                                                              | 8.9                                                                               | 36.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.3                                                                               | 5.0                                                                               | 5.1                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.4                                                                               | 17.0                                                                              | 4.9                                                                               | 6.7                                                                               | 3.5                                                                               | 2.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 7.3                                                                               | 0.2                                                                               | 0.3                                                                               | 0.1                                                                               | 7.1                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.38                                                                              | 1.00                                                                              | 0.91                                                                              | 0.97                                                                              | 0.86                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.01                                                                              | 0.14                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              |                                                                                   | 1781                                                                              | 1781                                                                              | 1781                                                                              |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 |                                                                                   | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   | 3515                                                                              | 291                                                                               | 220                                                                               |                                                                                   | 3492                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 |                                                                                   |                                                                                   | 12                                                                                | 18                                                                                | 14                                                                                |                                                                                   | 16                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          |                                                                                   |                                                                                   | 106                                                                               | 1227                                                                              | 1301                                                                              |                                                                                   | 124                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

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|                                     |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|
| Lanes in Grp                        | 1    | 0    | 1    | 1    | 1    | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 17   | 0    | 30   | 35   | 70   | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781 | 0    | 1781 | 1781 | 1781 | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.4  | 0.0  | 1.6  | 1.8  | 1.5  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.4  | 0.0  | 1.6  | 1.8  | 1.5  | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 549  | 0    | 1781 | 1781 | 592  | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 59.6 | 0.0  | 0.0  | 0.0  | 59.6 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 47.0 | 0.0  | 0.0  | 0.0  | 59.6 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 363  | 0    | 147  | 176  | 501  | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.05 | 0.00 | 0.20 | 0.20 | 0.14 | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 421  | 0    | 322  | 330  | 583  | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.92 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 8.2  | 0.0  | 42.8 | 41.4 | 6.8  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0  | 0.0  | 0.7  | 0.5  | 0.1  | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 8.2  | 0.0  | 43.5 | 42.0 | 6.9  | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.1  | 0.0  | 0.7  | 0.8  | 0.5  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.1  | 0.0  | 0.7  | 0.8  | 0.5  | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.03 | 0.00 | 0.24 | 0.28 | 0.09 | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |      |      |      |      |      |      |      |      |
| Assigned Mvmt                       | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment                     | T    |      |      | T    |      |      |      |      |
| Lanes in Grp                        | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0    | 502  | 0    | 0    | 0    | 457  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0    | 1777 | 0    | 0    | 0    | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0  | 15.0 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0  | 15.0 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0    | 1101 | 0    | 0    | 0    | 1058 | 0    | 0    |
| V/C Ratio (X)                       | 0.00 | 0.46 | 0.00 | 0.00 | 0.00 | 0.43 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0    | 1101 | 0    | 0    | 0    | 1058 | 0    | 0    |
| Upstream Filter (I)                 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0  | 10.1 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0  | 1.4  | 0.0  | 0.0  | 0.0  | 1.2  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0  | 11.4 | 0.0  | 0.0  | 0.0  | 1.2  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0  | 5.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.4  | 0.0  | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  |

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# HCM 6th Signalized Intersection Capacity Analysis

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|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 5.8  | 0.0  | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.34 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 522  | 47   | 76   | 0    | 474  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1844 | 1518 | 1521 | 0    | 1840 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 15.0 | 2.9  | 4.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 15.0 | 2.9  | 4.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.86 | 0.00 | 0.07 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1143 | 126  | 150  | 0    | 1096 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.46 | 0.37 | 0.51 | 0.00 | 0.43 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1143 | 275  | 281  | 0    | 1096 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 10.1 | 43.4 | 42.7 | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.3  | 1.8  | 2.6  | 0.0  | 1.1  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 11.4 | 45.3 | 45.4 | 0.0  | 1.1  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 5.6  | 1.1  | 1.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.4  | 0.1  | 0.1  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 6.0  | 1.2  | 1.9  | 0.0  | 0.3  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.35 | 0.11 | 0.23 | 0.00 | 0.02 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |     |
|--------------------|-----|
| HCM 6th Ctrl Delay | 9.8 |
| HCM 6th LOS        | A   |

| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 2.2    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 6      | 37    | 4     | 10     | 110  | 23    | 23     | 0     | 4     | 6      | 3     | 3     |
| Future Vol, veh/h        | 6      | 37    | 4     | 10     | 110  | 23    | 23     | 0     | 4     | 6      | 3     | 3     |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 7      | 40    | 4     | 11     | 120  | 25    | 25     | 0     | 4     | 7      | 3     | 3     |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 145    | 0     | 0     | 44     | 0    | 0     | 214    | 223   | 42    | 213    | 213   | 133   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 56     | 56    | -     | 155    | 155   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 158    | 167   | -     | 58     | 58    | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1437   | -     | -     | 1564   | -    | -     | 743    | 676   | 1029  | 744    | 684   | 916   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 956    | 848   | -     | 847    | 769   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 844    | 760   | -     | 954    | 847   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1437   | -     | -     | 1564   | -    | -     | 730    | 667   | 1029  | 734    | 675   | 916   |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 730    | 667   | -     | 734    | 675   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 951    | 844   | -     | 843    | 763   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 831    | 754   | -     | 945    | 843   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 1      |       |       | 0.5    |      |       | 9.9    |       |       | 9.9    |       |       |
| HCM LOS                  |        |       |       |        |      |       | A      |       |       | A      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 730    | 1029  | 1437  | -      | -    | 1564  | -      | -     | 755   |        |       |       |
| HCM Lane V/C Ratio       | 0.034  | 0.004 | 0.005 | -      | -    | 0.007 | -      | -     | 0.017 |        |       |       |
| HCM Control Delay (s)    | 10.1   | 8.5   | 7.5   | 0      | -    | 7.3   | 0      | -     | 9.9   |        |       |       |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -     | A     |        |       |       |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -     | 0.1   |        |       |       |



Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 33  | 37 | 6   | 2    | 72  | 42  | 31 |
| Average Queue (ft)    | 8   | 6  | 0   | 0    | 26  | 10  | 6  |
| 95th Queue (ft)       | 29  | 27 | 6   | 2    | 57  | 35  | 27 |
| Link Distance (ft)    |     |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |    |     |      |     |     |    |
| Queuing Penalty (veh) |     |    |     |      |     |     |    |
| Storage Bay Dist (ft) | 100 | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0  |     |      |     | 0   |    |
| Queuing Penalty (veh) |     | 1  |     |      |     | 0   |    |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 106 | 153 | 57  | 55  |
| Average Queue (ft)    | 51  | 83  | 31  | 29  |
| 95th Queue (ft)       | 87  | 137 | 50  | 49  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 61  | 73  | 28  | 102 |
| Average Queue (ft)    | 31  | 38  | 2   | 47  |
| 95th Queue (ft)       | 51  | 62  | 15  | 78  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 72 | 103 | 71 | 92  | 167 | 298 | 244 | 82  | 210 | 207 |
| Average Queue (ft)    | 25 | 38  | 25 | 31  | 47  | 148 | 115 | 13  | 85  | 88  |
| 95th Queue (ft)       | 59 | 75  | 62 | 70  | 116 | 266 | 227 | 49  | 164 | 173 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    |     |    |     |     |     |     |     |     |     |
| Queuing Penalty (veh) |    |     |    |     |     |     |     |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 1  | 2   | 1  | 1   | 0   | 7   |     |     | 2   |     |
| Queuing Penalty (veh) | 1  | 1   | 1  | 0   | 0   | 5   |     |     | 0   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 17  | 16   | 43  | 30  | 33  |
| Average Queue (ft)    | 1   | 1    | 16  | 4   | 10  |
| 95th Queue (ft)       | 8   | 7    | 42  | 20  | 33  |
| Link Distance (ft)    | 825 | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 2.4                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 5                                                                                 | 387                                                                               | 82                                                                                | 6                                                                                 | 798                                                                               | 11   | 72   | 1                                                                                 | 1    | 15   | 2                                                                                   | 30                                                                                  |
| Future Vol, veh/h        | 5                                                                                 | 387                                                                               | 82                                                                                | 6                                                                                 | 798                                                                               | 11   | 72   | 1                                                                                 | 1    | 15   | 2                                                                                   | 30                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 6                                                                                 | 435                                                                               | 92                                                                                | 7                                                                                 | 897                                                                               | 12   | 81   | 1                                                                                 | 1    | 17   | 2                                                                                   | 34                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 909    | 0 | 0 | 529    | 0 | 0 | 1385   | 1372  | 437   | 1411   | 1458  | 904   |
| Stage 1              | -      | - | - | -      | - | - | 449    | 449   | -     | 917    | 917   | -     |
| Stage 2              | -      | - | - | -      | - | - | 936    | 923   | -     | 494    | 541   | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 749    | - | - | 1038   | - | - | 121    | 146   | 620   | 116    | 129   | 335   |
| Stage 1              | -      | - | - | -      | - | - | 589    | 572   | -     | 326    | 351   | -     |
| Stage 2              | -      | - | - | -      | - | - | 318    | 349   | -     | 557    | 521   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 749    | - | - | 1036   | - | - | 107    | 144   | 619   | 114    | 127   | 335   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 212    | 254   | -     | 232    | 244   | -     |
| Stage 1              | -      | - | - | -      | - | - | 583    | 566   | -     | 323    | 349   | -     |
| Stage 2              | -      | - | - | -      | - | - | 282    | 347   | -     | 550    | 516   | -     |

| Approach             | EB  |  |  | WB  |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 0.1 |  |  | 0.1 |  |  | 32.1 |  |  | 18.7 |  |  |
| HCM LOS              |     |  |  |     |  |  | D    |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 214   | 749   | -   | -   | 1036  | -   | -   | 233   | 335   |
| HCM Lane V/C Ratio    | 0.389 | 0.008 | -   | -   | 0.007 | -   | -   | 0.082 | 0.101 |
| HCM Control Delay (s) | 32.1  | 9.8   | -   | -   | 8.5   | -   | -   | 21.8  | 16.9  |
| HCM Lane LOS          | D     | A     | -   | -   | A     | -   | -   | C     | C     |
| HCM 95th %tile Q(veh) | 1.7   | 0     | -   | -   | 0     | -   | -   | 0.3   | 0.3   |

HCM 6th AWSC  
13: Colorado Ave & 8th Street

08/08/2023

Intersection

Intersection Delay, s/veh 10.2

Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 29   | 176  | 59   | 24   | 148  | 62   | 42   | 9    | 28   | 34   | 17   | 29   |
| Future Vol, veh/h   | 29   | 176  | 59   | 24   | 148  | 62   | 42   | 9    | 28   | 34   | 17   | 29   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 34   | 205  | 69   | 28   | 172  | 72   | 49   | 10   | 33   | 40   | 20   | 34   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB  | SB  |
|----------------------------|------|------|-----|-----|
| Opposing Approach          | WB   | EB   | SB  | NB  |
| Opposing Lanes             | 1    | 1    | 1   | 1   |
| Conflicting Approach Left  | SB   | NB   | EB  | WB  |
| Conflicting Lanes Left     | 1    | 1    | 1   | 1   |
| Conflicting Approach Right | NB   | SB   | WB  | EB  |
| Conflicting Lanes Right    | 1    | 1    | 1   | 1   |
| HCM Control Delay          | 10.7 | 10.2 | 9.2 | 9.2 |
| HCM LOS                    | B    | B    | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 53%   | 11%   | 10%   | 42%   |
| Vol Thru, %            | 11%   | 67%   | 63%   | 21%   |
| Vol Right, %           | 35%   | 22%   | 26%   | 36%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 79    | 264   | 234   | 80    |
| LT Vol                 | 42    | 29    | 24    | 34    |
| Through Vol            | 9     | 176   | 148   | 17    |
| RT Vol                 | 28    | 59    | 62    | 29    |
| Lane Flow Rate         | 92    | 307   | 272   | 93    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.135 | 0.394 | 0.35  | 0.136 |
| Departure Headway (Hd) | 5.275 | 4.616 | 4.63  | 5.248 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 672   | 774   | 770   | 676   |
| Service Time           | 3.365 | 2.679 | 2.695 | 3.337 |
| HCM Lane V/C Ratio     | 0.137 | 0.397 | 0.353 | 0.138 |
| HCM Control Delay      | 9.2   | 10.7  | 10.2  | 9.2   |
| HCM Lane LOS           | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.5   | 1.9   | 1.6   | 0.5   |

Intersection

Intersection Delay, s/veh 8  
Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 13   | 61   | 15   | 17   | 44   | 40   | 0    | 0    | 0    | 50   | 36   | 16   |
| Future Vol, veh/h   | 13   | 61   | 15   | 17   | 44   | 40   | 0    | 0    | 0    | 50   | 36   | 16   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 15   | 71   | 17   | 20   | 51   | 47   | 0    | 0    | 0    | 58   | 42   | 19   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB  |
|----------------------------|-----|-----|----|-----|
| Opposing Approach          | WB  | EB  | SB | NB  |
| Opposing Lanes             | 1   | 1   | 1  | 1   |
| Conflicting Approach Left  | SB  | NB  | EB | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1   |
| Conflicting Approach Right | NB  | SB  | WB | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1   |
| HCM Control Delay          | 7.9 | 7.8 | 0  | 8.2 |
| HCM LOS                    | A   | A   | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 15%   | 17%   | 49%   |
| Vol Thru, %            | 100%  | 69%   | 44%   | 35%   |
| Vol Right, %           | 0%    | 17%   | 40%   | 16%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 89    | 101   | 102   |
| LT Vol                 | 0     | 13    | 17    | 50    |
| Through Vol            | 0     | 61    | 44    | 36    |
| RT Vol                 | 0     | 15    | 40    | 16    |
| Lane Flow Rate         | 0     | 103   | 117   | 119   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.123 | 0.135 | 0.146 |
| Departure Headway (Hd) | 4.551 | 4.267 | 4.125 | 4.418 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 844   | 874   | 815   |
| Service Time           | 2.569 | 2.271 | 2.127 | 2.431 |
| HCM Lane V/C Ratio     | 0     | 0.122 | 0.134 | 0.146 |
| HCM Control Delay      | 7.6   | 7.9   | 7.8   | 8.2   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.5   | 0.5   |



# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 46                                                                                | 11                                                                                | 49                                                                                | 30                                                                                | 16                                                                                | 88                                                                                | 43                                                                                  | 1667                                                                                | 15                                                                                  | 23                                                                                  | 810                                                                                 | 23                                                                                  |
| Future Volume (veh/h)         | 46                                                                                | 11                                                                                | 49                                                                                | 30                                                                                | 16                                                                                | 88                                                                                | 43                                                                                  | 1667                                                                                | 15                                                                                  | 23                                                                                  | 810                                                                                 | 23                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.91                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 47                                                                                | 11                                                                                | 51                                                                                | 31                                                                                | 16                                                                                | 91                                                                                | 44                                                                                  | 1719                                                                                | 15                                                                                  | 24                                                                                  | 835                                                                                 | 24                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 134                                                                               | 20                                                                                | 93                                                                                | 164                                                                               | 21                                                                                | 119                                                                               | 479                                                                                 | 2550                                                                                | 22                                                                                  | 200                                                                                 | 2470                                                                                | 71                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.03                                                                                | 0.71                                                                                | 0.71                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 76.2                                                                              | 0.0                                                                               | 79.9                                                                              | 71.8                                                                              | 0.0                                                                               | 91.4                                                                              | 7.4                                                                                 | 16.9                                                                                | 16.8                                                                                | 13.3                                                                                | 10.7                                                                                | 10.6                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | E                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 109                                                                               |                                                                                   |                                                                                   | 138                                                                               |                                                                                   |                                                                                   | 1778                                                                                |                                                                                     |                                                                                     | 883                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.3                                                                              |                                                                                   |                                                                                   | 87.0                                                                              |                                                                                   |                                                                                   | 16.6                                                                                |                                                                                     |                                                                                     | 10.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 7.9                                                                               |                                                                                   | 124.6                                                                             | 20.2                                                                              | 17.3                                                                              | 8.9                                                                               | 123.6                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              | 18.5                                                                              | 5.7                                                                               | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.2                                                                               | 5.3                                                                               | 4.9                                                                               | 3.8                                                                               | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.6                                                                               |                                                                                   | 47.5                                                                              | 13.7                                                                              | 8.8                                                                               | 3.2                                                                               | 17.8                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 23.5                                                                              | 0.2                                                                               | 0.3                                                                               | 0.0                                                                               | 6.7                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.68                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.87                                                                              | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 0.93                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              | 0.03                                                                              | 1.00                                                                              | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              |                                                                                   | 1781                                                                              |                                                                                   | 1781                                                                              | 1781                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3609                                                                              |                                                                                   | 227                                                                               |                                                                                   | 266                                                                               | 3524                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 31                                                                                |                                                                                   | 1289                                                                              |                                                                                   | 1235                                                                              | 101                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

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# HCM 6th Signalized Intersection Capacity Analysis

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|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 24    | 0    | 31   | 47   | 44    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781  | 0    | 1781 | 1781 | 1781  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.6   | 0.0  | 2.7  | 4.3  | 1.2   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.6   | 0.0  | 2.7  | 4.3  | 1.2   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 279   | 0    | 1781 | 1781 | 643   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 119.1 | 0.0  | 0.0  | 0.0  | 119.1 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 74.7  | 0.0  | 0.0  | 0.0  | 103.3 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 4.2   | 0.0  | 0.0  | 0.0  | 1.2   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 200   | 0    | 164  | 134  | 479   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.12  | 0.00 | 0.19 | 0.35 | 0.09  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 233   | 0    | 196  | 194  | 493   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 13.1  | 0.0  | 71.3 | 74.6 | 7.3   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.3   | 0.0  | 0.6  | 1.6  | 0.1   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 13.3  | 0.0  | 71.8 | 76.2 | 7.4   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.3   | 0.0  | 1.3  | 2.0  | 0.5   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.3   | 0.0  | 1.3  | 2.0  | 0.5   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.05  | 0.00 | 0.44 | 0.69 | 0.08  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      | T    |       |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 845  | 0    | 0    | 0     | 421  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1777 | 0    | 0    | 0     | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 45.3 | 0.0  | 0.0  | 0.0   | 15.8 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 45.3 | 0.0  | 0.0  | 0.0   | 15.8 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1255 | 0    | 0    | 0     | 1245 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.67 | 0.00 | 0.00 | 0.00  | 0.34 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1255 | 0    | 0    | 0     | 1245 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 14.0 | 0.0  | 0.0  | 0.0   | 10.0 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 2.9  | 0.0  | 0.0  | 0.0   | 0.7  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 16.9 | 0.0  | 0.0  | 0.0   | 10.7 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 17.7 | 0.0  | 0.0  | 0.0   | 6.2  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 1.0  | 0.0  | 0.0  | 0.0   | 0.2  | 0.0  | 0.0  |

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# HCM 6th Signalized Intersection Capacity Analysis

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|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 18.7 | 0.0  | 0.0  | 0.0  | 6.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.10 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 889  | 107  | 62   | 0    | 438  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1864 | 1515 | 1501 | 0    | 1849 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 45.5 | 11.7 | 6.8  | 0.0  | 15.8 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 45.5 | 11.7 | 6.8  | 0.0  | 15.8 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.82 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1317 | 140  | 113  | 0    | 1296 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.67 | 0.77 | 0.55 | 0.00 | 0.34 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1317 | 167  | 163  | 0    | 1296 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 14.0 | 75.4 | 75.8 | 0.0  | 10.0 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 2.8  | 16.0 | 4.1  | 0.0  | 0.7  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 16.8 | 91.4 | 79.9 | 0.0  | 10.6 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 18.6 | 4.6  | 2.6  | 0.0  | 6.4  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.0  | 0.6  | 0.1  | 0.0  | 0.2  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 19.6 | 5.2  | 2.8  | 0.0  | 6.7  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.15 | 0.48 | 0.33 | 0.00 | 0.41 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 20.5 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 2.7    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 4      | 75    | 6     | 1      | 55   | 0     | 18     | 3     | 4     | 13     | 2     | 13    |
| Future Vol, veh/h        | 4      | 75    | 6     | 1      | 55   | 0     | 18     | 3     | 4     | 13     | 2     | 13    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 4      | 82    | 7     | 1      | 60   | 0     | 20     | 3     | 4     | 14     | 2     | 14    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 60     | 0     | 0     | 89     | 0    | 0     | 164    | 156   | 86    | 159    | 159   | 60    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 94     | 94    | -     | 62     | 62    | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 70     | 62    | -     | 97     | 97    | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1544   | -     | -     | 1506   | -    | -     | 801    | 736   | 973   | 807    | 733   | 1005  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 913    | 817   | -     | 949    | 843   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 940    | 843   | -     | 910    | 815   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1544   | -     | -     | 1506   | -    | -     | 786    | 733   | 973   | 798    | 730   | 1005  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 786    | 733   | -     | 798    | 730   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 910    | 815   | -     | 946    | 842   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 923    | 842   | -     | 900    | 813   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 0.3    |       |       | 0.1    |      |       | 9.6    |       |       | 9.3    |       |       |
| HCM LOS                  |        |       |       |        |      |       | A      |       |       | A      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 778    | 973   | 1544  | -      | -    | 1506  | -      | -     | -     | 876    |       |       |
| HCM Lane V/C Ratio       | 0.029  | 0.004 | 0.003 | -      | -    | 0.001 | -      | -     | -     | 0.035  |       |       |
| HCM Control Delay (s)    | 9.8    | 8.7   | 7.3   | 0      | -    | 7.4   | 0      | -     | -     | 9.3    |       |       |
| HCM Lane LOS             | A      | A     | A     | A      | -    | A     | A      | -     | -     | A      |       |       |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -     | -     | 0.1    |       |       |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 26  | 4   | 37 | 24  | 22   | 97  | 39  | 70 |
| Average Queue (ft)    | 2   | 0   | 5  | 2   | 1    | 33  | 13  | 23 |
| 95th Queue (ft)       | 13  | 3   | 25 | 15  | 14   | 71  | 39  | 54 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      |     |     |    |
| Queuing Penalty (veh) |     |     |    |     |      |     |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     |      |     |     | 0  |
| Queuing Penalty (veh) |     | 0   | 0  |     |      |     |     | 0  |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 180 | 142 | 68  | 80  |
| Average Queue (ft)    | 77  | 56  | 32  | 35  |
| 95th Queue (ft)       | 170 | 102 | 57  | 61  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 3   | 0   |     |     |
| Queuing Penalty (veh) | 8   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

## Intersection: 15: 9th Street &amp; Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 65  | 67  | 70  |
| Average Queue (ft)    | 33  | 35  | 34  |
| 95th Queue (ft)       | 53  | 56  | 55  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Intersection: 16: 9th Street &amp; SH-82

| Movement              | EB | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 97 | 148 | 100 | 229 | 174 | 461 | 459 | 149 | 299 | 296 |
| Average Queue (ft)    | 46 | 47  | 37  | 94  | 41  | 341 | 288 | 26  | 108 | 104 |
| 95th Queue (ft)       | 90 | 108 | 92  | 190 | 133 | 538 | 503 | 85  | 237 | 229 |
| Link Distance (ft)    |    | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |     | 0   |     | 11  | 7   |     |     |     |
| Queuing Penalty (veh) |    | 0   |     | 0   |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 12 | 5   | 4   | 27  |     | 27  |     | 0   | 6   |     |
| Queuing Penalty (veh) | 7  | 2   | 4   | 8   |     | 12  |     | 0   | 1   |     |

## Intersection: 20: GMF/PnR &amp; Wulfsohn Road

| Movement              | WB   | NB  | NB  | SB  |
|-----------------------|------|-----|-----|-----|
| Directions Served     | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 2    | 34  | 31  | 36  |
| Average Queue (ft)    | 0    | 15  | 5   | 19  |
| 95th Queue (ft)       | 2    | 40  | 24  | 43  |
| Link Distance (ft)    | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |      |     |     |     |
| Queuing Penalty (veh) |      |     |     |     |
| Storage Bay Dist (ft) |      |     |     |     |
| Storage Blk Time (%)  |      |     |     |     |
| Queuing Penalty (veh) |      |     |     |     |



HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 1.4                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 31                                                                                | 958                                                                               | 86                                                                                | 1                                                                                 | 384                                                                               | 19   | 42   | 0                                                                                 | 4    | 7    | 4                                                                                   | 6                                                                                   |
| Future Vol, veh/h        | 31                                                                                | 958                                                                               | 86                                                                                | 1                                                                                 | 384                                                                               | 19   | 42   | 0                                                                                 | 4    | 7    | 4                                                                                   | 6                                                                                   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0    | 0    | 0                                                                                 | 0    | 0    | 0                                                                                   | 0                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88                                                                                | 88   | 88   | 88                                                                                | 88   | 88   | 88                                                                                  | 88                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 35                                                                                | 1089                                                                              | 98                                                                                | 1                                                                                 | 436                                                                               | 22   | 48   | 0                                                                                 | 5    | 8    | 5                                                                                   | 7                                                                                   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 458    | 0 | 0 | 1187   | 0 | 0 | 1614   | 1619  | 1089  | 1660   | 1706  | 447   |
| Stage 1              | -      | - | - | -      | - | - | 1159   | 1159  | -     | 449    | 449   | -     |
| Stage 2              | -      | - | - | -      | - | - | 455    | 460   | -     | 1211   | 1257  | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 1103   | - | - | 588    | - | - | 84     | 103   | 262   | 78     | 91    | 612   |
| Stage 1              | -      | - | - | -      | - | - | 238    | 270   | -     | 589    | 572   | -     |
| Stage 2              | -      | - | - | -      | - | - | 585    | 566   | -     | 223    | 243   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 1103   | - | - | 588    | - | - | 79     | 99    | 262   | 75     | 88    | 612   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 176    | 198   | -     | 166    | 183   | -     |
| Stage 1              | -      | - | - | -      | - | - | 230    | 261   | -     | 570    | 571   | -     |
| Stage 2              | -      | - | - | -      | - | - | 573    | 565   | -     | 212    | 235   | -     |

| Approach             | EB  |  |  | WB |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 0.2 |  |  | 0  |  |  | 32.8 |  |  | 21.7 |  |  |
| HCM LOS              |     |  |  |    |  |  | D    |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 181   | 1103  | -   | -   | 588   | -   | -   | 172   | 612   |
| HCM Lane V/C Ratio    | 0.289 | 0.032 | -   | -   | 0.002 | -   | -   | 0.073 | 0.011 |
| HCM Control Delay (s) | 32.8  | 8.4   | -   | -   | 11.1  | -   | -   | 27.6  | 10.9  |
| HCM Lane LOS          | D     | A     | -   | -   | B     | -   | -   | D     | B     |
| HCM 95th %tile Q(veh) | 1.1   | 0.1   | -   | -   | 0     | -   | -   | 0.2   | 0     |

Intersection

Intersection Delay, s/veh 12.1

Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 14   | 210  | 58   | 127  | 193  | 76   | 43   | 18   | 19   | 20   | 26   | 23   |
| Future Vol, veh/h   | 14   | 210  | 58   | 127  | 193  | 76   | 43   | 18   | 19   | 20   | 26   | 23   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 15   | 228  | 63   | 138  | 210  | 83   | 47   | 20   | 21   | 22   | 28   | 25   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB  | SB  |
|----------------------------|------|------|-----|-----|
| Opposing Approach          | WB   | EB   | SB  | NB  |
| Opposing Lanes             | 1    | 1    | 1   | 1   |
| Conflicting Approach Left  | SB   | NB   | EB  | WB  |
| Conflicting Lanes Left     | 1    | 1    | 1   | 1   |
| Conflicting Approach Right | NB   | SB   | WB  | EB  |
| Conflicting Lanes Right    | 1    | 1    | 1   | 1   |
| HCM Control Delay          | 11.1 | 13.7 | 9.8 | 9.5 |
| HCM LOS                    | B    | B    | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 54%   | 5%    | 32%   | 29%   |
| Vol Thru, %            | 23%   | 74%   | 49%   | 38%   |
| Vol Right, %           | 24%   | 21%   | 19%   | 33%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 80    | 282   | 396   | 69    |
| LT Vol                 | 43    | 14    | 127   | 20    |
| Through Vol            | 18    | 210   | 193   | 26    |
| RT Vol                 | 19    | 58    | 76    | 23    |
| Lane Flow Rate         | 87    | 307   | 430   | 75    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.14  | 0.405 | 0.56  | 0.119 |
| Departure Headway (Hd) | 5.806 | 4.762 | 4.684 | 5.726 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 621   | 745   | 762   | 629   |
| Service Time           | 3.809 | 2.854 | 2.768 | 3.731 |
| HCM Lane V/C Ratio     | 0.14  | 0.412 | 0.564 | 0.119 |
| HCM Control Delay      | 9.8   | 11.1  | 13.7  | 9.5   |
| HCM Lane LOS           | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.5   | 2     | 3.5   | 0.4   |

Intersection

Intersection Delay, s/veh 9.1

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 27   | 34   | 17   | 12   | 36   | 70   | 3    | 0    | 0    | 73   | 150  | 36   |
| Future Vol, veh/h   | 27   | 34   | 17   | 12   | 36   | 70   | 3    | 0    | 0    | 73   | 150  | 36   |
| Peak Hour Factor    | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 29   | 37   | 18   | 13   | 39   | 75   | 3    | 0    | 0    | 78   | 161  | 39   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB | SB  |
|----------------------------|-----|-----|----|-----|
| Opposing Approach          | WB  | EB  | SB | NB  |
| Opposing Lanes             | 1   | 1   | 1  | 1   |
| Conflicting Approach Left  | SB  | NB  | EB | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1  | 1   |
| Conflicting Approach Right | NB  | SB  | WB | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1  | 1   |
| HCM Control Delay          | 8.3 | 8.2 | 8  | 9.7 |
| HCM LOS                    | A   | A   | A  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 10%   | 28%   |
| Vol Thru, %            | 0%    | 44%   | 31%   | 58%   |
| Vol Right, %           | 0%    | 22%   | 59%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 3     | 78    | 118   | 259   |
| LT Vol                 | 3     | 27    | 12    | 73    |
| Through Vol            | 0     | 34    | 36    | 150   |
| RT Vol                 | 0     | 17    | 70    | 36    |
| Lane Flow Rate         | 3     | 84    | 127   | 278   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.004 | 0.109 | 0.153 | 0.34  |
| Departure Headway (Hd) | 4.933 | 4.67  | 4.352 | 4.392 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 725   | 768   | 825   | 819   |
| Service Time           | 2.965 | 2.696 | 2.377 | 2.413 |
| HCM Lane V/C Ratio     | 0.004 | 0.109 | 0.154 | 0.339 |
| HCM Control Delay      | 8     | 8.3   | 8.2   | 9.7   |
| HCM Lane LOS           | A     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.5   | 1.5   |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |  |  |  |  |  |  |   |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 37                                                                                | 12                                                                                | 71                                                                                | 32                                                                                | 10                                                                                | 41                                                                                | 77                                                                                  | 1076                                                                                | 32                                                                                  | 19                                                                                  | 974                                                                                 | 35                                                                                  |
| Future Volume (veh/h)         | 37                                                                                | 12                                                                                | 71                                                                                | 32                                                                                | 10                                                                                | 41                                                                                | 77                                                                                  | 1076                                                                                | 32                                                                                  | 19                                                                                  | 974                                                                                 | 35                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                              |                                                                                   | 0.92                                                                              | 0.99                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.94                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 38                                                                                | 12                                                                                | 72                                                                                | 33                                                                                | 10                                                                                | 42                                                                                | 79                                                                                  | 1098                                                                                | 33                                                                                  | 19                                                                                  | 994                                                                                 | 36                                                                                  |
| Peak Hour Factor              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                              | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 184                                                                               | 22                                                                                | 135                                                                               | 153                                                                               | 25                                                                                | 105                                                                               | 468                                                                                 | 2147                                                                                | 65                                                                                  | 324                                                                                 | 2047                                                                                | 74                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 2.00                                                                                | 2.00                                                                                | 2.00                                                                                |
| Prop Arrive On Green          | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.04                                                                                | 0.61                                                                                | 0.61                                                                                | 0.04                                                                                | 1.00                                                                                | 1.00                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 41.7                                                                              | 0.0                                                                               | 45.4                                                                              | 43.3                                                                              | 0.0                                                                               | 45.2                                                                              | 7.3                                                                                 | 12.7                                                                                | 12.7                                                                                | 8.9                                                                                 | 1.5                                                                                 | 1.4                                                                                 |
| Ln Grp LOS                    | D                                                                                 | A                                                                                 | D                                                                                 | D                                                                                 | A                                                                                 | D                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Approach Vol, veh/h           | 122                                                                               |                                                                                   |                                                                                   | 85                                                                                |                                                                                   |                                                                                   | 1210                                                                                |                                                                                     |                                                                                     | 1049                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 44.2                                                                              |                                                                                   |                                                                                   | 44.5                                                                              |                                                                                   |                                                                                   | 12.4                                                                                |                                                                                     |                                                                                     | 1.6                                                                                 |                                                                                     |                                                                                     |
| Approach LOS                  | D                                                                                 |                                                                                   |                                                                                   | D                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               | 4.0                                                                               | 10.0                                                                              | 10.0                                                                              | 1.1                                                                               | 4.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 6.6                                                                               | 65.6                                                                              | 13.1                                                                              | 14.8                                                                              | 8.9                                                                               | 63.2                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               | 4.5                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 5.1                                                                               | 40.3                                                                              | 18.1                                                                              | 18.5                                                                              | 8.9                                                                               | 36.5                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               | 5.3                                                                               | 5.0                                                                               | 5.1                                                                               | 3.8                                                                               | 5.3                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.4                                                                               | 19.7                                                                              | 5.2                                                                               | 7.2                                                                               | 3.7                                                                               | 2.0                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               | 7.9                                                                               | 0.2                                                                               | 0.4                                                                               | 0.1                                                                               | 8.2                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.41                                                                              | 1.00                                                                              | 0.93                                                                              | 0.98                                                                              | 0.89                                                                              | 1.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              | 0.00                                                                              | 0.00                                                                              | 0.02                                                                              | 0.20                                                                              | 0.00                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              | 1781                                                                              | 1781                                                                              | 1781                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 | 8                                                                                 | 4                                                                                 | 6                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3516                                                                              | 293                                                                               | 218                                                                               | 3489                                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                | 18                                                                                | 14                                                                                | 16                                                                                |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 106                                                                               | 1229                                                                              | 1307                                                                              | 126                                                                               |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 | 0                                                                                 | 3                                                                                 | 7                                                                                 | 5                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   |                                                                                   | L                                                                                 | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                                     |      |      |      |      |      |      |      |      |
|-------------------------------------|------|------|------|------|------|------|------|------|
| Lanes in Grp                        | 1    | 0    | 1    | 1    | 1    | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 19   | 0    | 33   | 38   | 79   | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781 | 0    | 1781 | 1781 | 1781 | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.4  | 0.0  | 1.7  | 2.0  | 1.7  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.4  | 0.0  | 1.7  | 2.0  | 1.7  | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 497  | 0    | 1781 | 1781 | 540  | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 58.7 | 0.0  | 0.0  | 0.0  | 58.7 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 43.4 | 0.0  | 0.0  | 0.0  | 58.7 | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.6  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 324  | 0    | 153  | 184  | 468  | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.06 | 0.00 | 0.22 | 0.21 | 0.17 | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 378  | 0    | 322  | 330  | 548  | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.92 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 8.8  | 0.0  | 42.6 | 41.1 | 7.1  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1  | 0.0  | 0.7  | 0.6  | 0.2  | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 8.9  | 0.0  | 43.3 | 41.7 | 7.3  | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.2  | 0.0  | 0.8  | 0.9  | 0.6  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.2  | 0.0  | 0.8  | 0.9  | 0.6  | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.03 | 0.00 | 0.27 | 0.30 | 0.11 | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |      |      |      |      |      |      |      |      |
| Assigned Mvmt                       | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment                     | T    |      |      | T    |      |      |      |      |
| Lanes in Grp                        | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0    | 555  | 0    | 0    | 0    | 506  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0    | 1777 | 0    | 0    | 0    | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0  | 17.7 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0  | 17.7 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0    | 1085 | 0    | 0    | 0    | 1043 | 0    | 0    |
| V/C Ratio (X)                       | 0.00 | 0.51 | 0.00 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0    | 1085 | 0    | 0    | 0    | 1043 | 0    | 0    |
| Upstream Filter (I)                 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0  | 11.0 | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0  | 1.7  | 0.0  | 0.0  | 0.0  | 1.5  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0  | 12.7 | 0.0  | 0.0  | 0.0  | 1.5  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0  | 6.4  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 6.9  | 0.0  | 0.0  | 0.0  | 0.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.41 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 576  | 52   | 84   | 0    | 524  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1844 | 1522 | 1524 | 0    | 1839 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 17.7 | 3.2  | 5.2  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 17.7 | 3.2  | 5.2  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.86 | 0.00 | 0.07 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1126 | 131  | 157  | 0    | 1079 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.51 | 0.40 | 0.53 | 0.00 | 0.49 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1126 | 276  | 282  | 0    | 1079 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 11.0 | 43.3 | 42.6 | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.7  | 2.0  | 2.8  | 0.0  | 1.4  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 12.7 | 45.2 | 45.4 | 0.0  | 1.4  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 6.6  | 1.2  | 2.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.5  | 0.1  | 0.1  | 0.0  | 0.4  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 7.2  | 1.3  | 2.1  | 0.0  | 0.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.42 | 0.12 | 0.25 | 0.00 | 0.03 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 10.5 |
| HCM 6th LOS        | B    |



| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 2.2    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 6      | 37    | 4     | 10     | 110  | 23    | 23     | 0     | 4     | 6      | 3     | 3     |
| Future Vol, veh/h        | 6      | 37    | 4     | 10     | 110  | 23    | 23     | 0     | 4     | 6      | 3     | 3     |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 7      | 40    | 4     | 11     | 120  | 25    | 25     | 0     | 4     | 7      | 3     | 3     |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 145    | 0     | 0     | 44     | 0    | 0     | 214    | 223   | 42    | 213    | 213   | 133   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 56     | 56    | -     | 155    | 155   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 158    | 167   | -     | 58     | 58    | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1437   | -     | -     | 1564   | -    | -     | 743    | 676   | 1029  | 744    | 684   | 916   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 956    | 848   | -     | 847    | 769   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 844    | 760   | -     | 954    | 847   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1437   | -     | -     | 1564   | -    | -     | 730    | 667   | 1029  | 734    | 675   | 916   |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 730    | 667   | -     | 734    | 675   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 951    | 844   | -     | 843    | 763   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 831    | 754   | -     | 945    | 843   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 1      |       |       | 0.5    |      |       | 9.9    |       |       | 9.9    |       |       |
| HCM LOS                  |        |       |       |        |      |       | A      |       |       | A      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 730    | 1029  | 1437  | -      | -    | 1564  | -      | -     | 755   |        |       |       |
| HCM Lane V/C Ratio       | 0.034  | 0.004 | 0.005 | -      | -    | 0.007 | -      | -     | 0.017 |        |       |       |
| HCM Control Delay (s)    | 10.1   | 8.5   | 7.5   | 0      | -    | 7.3   | 0      | -     | 9.9   |        |       |       |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -     | A     |        |       |       |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -     | 0.1   |        |       |       |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 38  | 38 | 9   | 2    | 85  | 37  | 31 |
| Average Queue (ft)    | 9   | 7  | 0   | 0    | 28  | 9   | 6  |
| 95th Queue (ft)       | 31  | 28 | 6   | 2    | 66  | 32  | 26 |
| Link Distance (ft)    |     |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |    |     |      |     |     |    |
| Queuing Penalty (veh) |     |    |     |      |     |     |    |
| Storage Bay Dist (ft) | 100 | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0  |     |      |     |     |    |
| Queuing Penalty (veh) |     | 1  |     |      |     |     |    |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 119 | 166 | 64  | 64  |
| Average Queue (ft)    | 58  | 94  | 33  | 32  |
| 95th Queue (ft)       | 97  | 146 | 53  | 55  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 66  | 70  | 31  | 100 |
| Average Queue (ft)    | 31  | 40  | 2   | 49  |
| 95th Queue (ft)       | 54  | 63  | 16  | 79  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 84 | 109 | 76 | 97  | 174 | 337 | 292 | 96  | 257 | 247 |
| Average Queue (ft)    | 32 | 42  | 22 | 33  | 61  | 171 | 135 | 18  | 114 | 109 |
| 95th Queue (ft)       | 72 | 83  | 58 | 70  | 147 | 306 | 261 | 59  | 218 | 213 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    |     |    |     |     | 0   |     |     |     |     |
| Queuing Penalty (veh) |    |     |    |     |     | 0   |     |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 2  | 3   | 1  | 1   | 0   | 10  |     |     | 5   |     |
| Queuing Penalty (veh) | 2  | 1   | 0  | 0   | 0   | 8   |     |     | 1   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 12  | 11   | 36  | 31  | 31  |
| Average Queue (ft)    | 1   | 0    | 16  | 5   | 11  |
| 95th Queue (ft)       | 7   | 6    | 41  | 23  | 35  |
| Link Distance (ft)    | 825 | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 2.6                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 5                                                                                 | 428                                                                               | 82                                                                                | 6                                                                                 | 882                                                                               | 11   | 72   | 1                                                                                 | 1    | 15   | 2                                                                                   | 30                                                                                  |
| Future Vol, veh/h        | 5                                                                                 | 428                                                                               | 82                                                                                | 6                                                                                 | 882                                                                               | 11   | 72   | 1                                                                                 | 1    | 15   | 2                                                                                   | 30                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 6                                                                                 | 481                                                                               | 92                                                                                | 7                                                                                 | 991                                                                               | 12   | 81   | 1                                                                                 | 1    | 17   | 2                                                                                   | 34                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 1003   | 0 | 0 | 575    | 0 | 0 | 1525   | 1512  | 483   | 1551   | 1598  | 998   |
| Stage 1              | -      | - | - | -      | - | - | 495    | 495   | -     | 1011   | 1011  | -     |
| Stage 2              | -      | - | - | -      | - | - | 1030   | 1017  | -     | 540    | 587   | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 690    | - | - | 998    | - | - | 96     | 120   | 584   | 92     | 106   | 296   |
| Stage 1              | -      | - | - | -      | - | - | 556    | 546   | -     | 289    | 317   | -     |
| Stage 2              | -      | - | - | -      | - | - | 282    | 315   | -     | 526    | 497   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 690    | - | - | 996    | - | - | 83     | 118   | 583   | 90     | 104   | 296   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 183    | 227   | -     | 204    | 219   | -     |
| Stage 1              | -      | - | - | -      | - | - | 550    | 540   | -     | 286    | 315   | -     |
| Stage 2              | -      | - | - | -      | - | - | 246    | 313   | -     | 519    | 492   | -     |

| Approach             | EB  |  |  | WB  |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 0.1 |  |  | 0.1 |  |  | 39.4 |  |  | 20.7 |  |  |
| HCM LOS              |     |  |  |     |  |  | E    |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 185   | 690   | -   | -   | 996   | -   | -   | 206   | 296   |
| HCM Lane V/C Ratio    | 0.449 | 0.008 | -   | -   | 0.007 | -   | -   | 0.093 | 0.114 |
| HCM Control Delay (s) | 39.4  | 10.3  | -   | -   | 8.6   | -   | -   | 24.3  | 18.7  |
| HCM Lane LOS          | E     | B     | -   | -   | A     | -   | -   | C     | C     |
| HCM 95th %tile Q(veh) | 2.1   | 0     | -   | -   | 0     | -   | -   | 0.3   | 0.4   |

Intersection

Intersection Delay, s/veh 10.8

Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 32   | 194  | 66   | 27   | 164  | 68   | 46   | 10   | 31   | 37   | 19   | 22   |
| Future Vol, veh/h   | 32   | 194  | 66   | 27   | 164  | 68   | 46   | 10   | 31   | 37   | 19   | 22   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 37   | 226  | 77   | 31   | 191  | 79   | 53   | 12   | 36   | 43   | 22   | 26   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB  | SB  |
|----------------------------|------|------|-----|-----|
| Opposing Approach          | WB   | EB   | SB  | NB  |
| Opposing Lanes             | 1    | 1    | 1   | 1   |
| Conflicting Approach Left  | SB   | NB   | EB  | WB  |
| Conflicting Lanes Left     | 1    | 1    | 1   | 1   |
| Conflicting Approach Right | NB   | SB   | WB  | EB  |
| Conflicting Lanes Right    | 1    | 1    | 1   | 1   |
| HCM Control Delay          | 11.5 | 10.9 | 9.5 | 9.5 |
| HCM LOS                    | B    | B    | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 53%   | 11%   | 10%   | 47%   |
| Vol Thru, %            | 11%   | 66%   | 63%   | 24%   |
| Vol Right, %           | 36%   | 23%   | 26%   | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 87    | 292   | 259   | 78    |
| LT Vol                 | 46    | 32    | 27    | 37    |
| Through Vol            | 10    | 194   | 164   | 19    |
| RT Vol                 | 31    | 66    | 68    | 22    |
| Lane Flow Rate         | 101   | 340   | 301   | 91    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.155 | 0.442 | 0.394 | 0.141 |
| Departure Headway (Hd) | 5.531 | 4.686 | 4.708 | 5.585 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 651   | 761   | 756   | 646   |
| Service Time           | 3.536 | 2.772 | 2.796 | 3.589 |
| HCM Lane V/C Ratio     | 0.155 | 0.447 | 0.398 | 0.141 |
| HCM Control Delay      | 9.5   | 11.5  | 10.9  | 9.5   |
| HCM Lane LOS           | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.5   | 2.3   | 1.9   | 0.5   |

Intersection

Intersection Delay, s/veh 8.1

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 14   | 68   | 17   | 19   | 49   | 44   | 0    | 0    | 0    | 56   | 38   | 18   |
| Future Vol, veh/h   | 14   | 68   | 17   | 19   | 49   | 44   | 0    | 0    | 0    | 56   | 38   | 18   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 16   | 79   | 20   | 22   | 57   | 51   | 0    | 0    | 0    | 65   | 44   | 21   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB | WB  | NB | SB  |
|----------------------------|----|-----|----|-----|
| Opposing Approach          | WB | EB  | SB | NB  |
| Opposing Lanes             | 1  | 1   | 1  | 1   |
| Conflicting Approach Left  | SB | NB  | EB | WB  |
| Conflicting Lanes Left     | 1  | 1   | 1  | 1   |
| Conflicting Approach Right | NB | SB  | WB | EB  |
| Conflicting Lanes Right    | 1  | 1   | 1  | 1   |
| HCM Control Delay          | 8  | 7.9 | 0  | 8.4 |
| HCM LOS                    | A  | A   | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 17%   | 50%   |
| Vol Thru, %            | 100%  | 69%   | 44%   | 34%   |
| Vol Right, %           | 0%    | 17%   | 39%   | 16%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 99    | 112   | 112   |
| LT Vol                 | 0     | 14    | 19    | 56    |
| Through Vol            | 0     | 68    | 49    | 38    |
| RT Vol                 | 0     | 17    | 44    | 18    |
| Lane Flow Rate         | 0     | 115   | 130   | 130   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.138 | 0.151 | 0.162 |
| Departure Headway (Hd) | 4.625 | 4.303 | 4.164 | 4.473 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 836   | 865   | 804   |
| Service Time           | 2.645 | 2.315 | 2.175 | 2.488 |
| HCM Lane V/C Ratio     | 0     | 0.138 | 0.15  | 0.162 |
| HCM Control Delay      | 7.6   | 8     | 7.9   | 8.4   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.5   | 0.5   | 0.6   |



# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |  |  |  |  |  |  |   |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 50                                                                                | 13                                                                                | 54                                                                                | 35                                                                                | 17                                                                                | 97                                                                                | 47                                                                                  | 1842                                                                                | 16                                                                                  | 25                                                                                  | 895                                                                                 | 25                                                                                  |
| Future Volume (veh/h)         | 50                                                                                | 13                                                                                | 54                                                                                | 35                                                                                | 17                                                                                | 97                                                                                | 47                                                                                  | 1842                                                                                | 16                                                                                  | 25                                                                                  | 895                                                                                 | 25                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.91                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 52                                                                                | 13                                                                                | 56                                                                                | 36                                                                                | 18                                                                                | 100                                                                               | 48                                                                                  | 1899                                                                                | 16                                                                                  | 26                                                                                  | 923                                                                                 | 26                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 139                                                                               | 22                                                                                | 96                                                                                | 171                                                                               | 22                                                                                | 124                                                                               | 435                                                                                 | 2524                                                                                | 21                                                                                  | 165                                                                                 | 2446                                                                                | 69                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.03                                                                                | 0.70                                                                                | 0.70                                                                                | 0.02                                                                                | 0.69                                                                                | 0.69                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 76.1                                                                              | 0.0                                                                               | 80.3                                                                              | 71.5                                                                              | 0.0                                                                               | 97.3                                                                              | 8.1                                                                                 | 20.4                                                                                | 20.3                                                                                | 17.8                                                                                | 11.7                                                                                | 11.6                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | C                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 121                                                                               |                                                                                   |                                                                                   | 154                                                                               |                                                                                   |                                                                                   | 1963                                                                                |                                                                                     |                                                                                     | 975                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.5                                                                              |                                                                                   |                                                                                   | 91.2                                                                              |                                                                                   |                                                                                   | 20.1                                                                                |                                                                                     |                                                                                     | 11.8                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              |                                                                                   | 10.0                                                                              | 1.1                                                                                 |                                                                                     | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 8.0                                                                               |                                                                                   | 123.3                                                                             | 20.9                                                                              |                                                                                   | 17.8                                                                              | 9.0                                                                                 |                                                                                     | 122.4                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                                 |                                                                                     | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              |                                                                                   | 18.5                                                                              | 5.7                                                                                 |                                                                                     | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.2                                                                               | 5.2                                                                               |                                                                                   | 4.9                                                                               | 3.8                                                                                 |                                                                                     | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.7                                                                               |                                                                                   | 59.0                                                                              | 14.9                                                                              |                                                                                   | 9.5                                                                               | 3.3                                                                                 |                                                                                     | 20.5                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 26.5                                                                              | 0.2                                                                               |                                                                                   | 0.3                                                                               | 0.0                                                                                 |                                                                                     | 7.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.71                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.90                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              |                                                                                   | 0.05                                                                              | 1.00                                                                                |                                                                                     | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              |                                                                                   | 1781                                                                              |                                                                                   | 1781                                                                              | 1781                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3610                                                                              |                                                                                   | 232                                                                               |                                                                                   | 284                                                                               | 3527                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 30                                                                                |                                                                                   | 1289                                                                              |                                                                                   | 1225                                                                              | 99                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                   |                                                                                     | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

2043 Background PM 4:02 pm 07/24/2023

Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 26    | 0    | 36   | 52   | 48    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781  | 0    | 1781 | 1781 | 1781  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.7   | 0.0  | 3.2  | 4.7  | 1.3   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.7   | 0.0  | 3.2  | 4.7  | 1.3   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 234   | 0    | 1781 | 1781 | 591   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 117.9 | 0.0  | 0.0  | 0.0  | 117.9 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 61.9  | 0.0  | 0.0  | 0.0  | 99.4  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 7.0   | 0.0  | 0.0  | 0.0  | 1.6   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 165   | 0    | 171  | 139  | 435   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.16  | 0.00 | 0.21 | 0.37 | 0.11  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 196   | 0    | 196  | 194  | 448   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 17.4  | 0.0  | 70.9 | 74.4 | 7.9   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.4   | 0.0  | 0.6  | 1.7  | 0.1   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 17.8  | 0.0  | 71.5 | 76.1 | 8.1   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.4   | 0.0  | 1.5  | 2.2  | 0.5   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.4   | 0.0  | 1.5  | 2.2  | 0.5   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.08  | 0.00 | 0.50 | 0.76 | 0.09  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      | T    |       |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 933  | 0    | 0    | 0     | 465  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1777 | 0    | 0    | 0     | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 56.6 | 0.0  | 0.0  | 0.0   | 18.5 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 56.6 | 0.0  | 0.0  | 0.0   | 18.5 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1242 | 0    | 0    | 0     | 1232 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.75 | 0.00 | 0.00 | 0.00  | 0.38 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1242 | 0    | 0    | 0     | 1232 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 16.2 | 0.0  | 0.0  | 0.0   | 10.8 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 4.2  | 0.0  | 0.0  | 0.0   | 0.8  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 20.4 | 0.0  | 0.0  | 0.0   | 11.7 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 22.3 | 0.0  | 0.0  | 0.0   | 7.3  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 1.5  | 0.0  | 0.0  | 0.0   | 0.3  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 23.7 | 0.0  | 0.0  | 0.0  | 7.6  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.39 | 0.00 | 0.00 | 0.00 | 0.47 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 982  | 118  | 69   | 0    | 484  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1864 | 1521 | 1510 | 0    | 1849 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 57.0 | 12.9 | 7.5  | 0.0  | 18.5 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 57.0 | 12.9 | 7.5  | 0.0  | 18.5 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.81 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1303 | 146  | 118  | 0    | 1282 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.75 | 0.81 | 0.59 | 0.00 | 0.38 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1303 | 167  | 164  | 0    | 1282 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 16.3 | 75.3 | 75.7 | 0.0  | 10.8 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 4.1  | 22.0 | 4.6  | 0.0  | 0.8  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 20.3 | 97.3 | 80.3 | 0.0  | 11.6 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 23.5 | 5.1  | 2.9  | 0.0  | 7.6  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.5  | 0.9  | 0.1  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 25.0 | 6.0  | 3.1  | 0.0  | 7.9  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.47 | 0.55 | 0.37 | 0.00 | 0.49 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 23.2 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 2.7    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 4      | 75    | 6     | 1      | 55   | 0     | 18     | 3     | 4     | 13     | 2     | 13    |
| Future Vol, veh/h        | 4      | 75    | 6     | 1      | 55   | 0     | 18     | 3     | 4     | 13     | 2     | 13    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 4      | 82    | 7     | 1      | 60   | 0     | 20     | 3     | 4     | 14     | 2     | 14    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 60     | 0     | 0     | 89     | 0    | 0     | 164    | 156   | 86    | 159    | 159   | 60    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 94     | 94    | -     | 62     | 62    | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 70     | 62    | -     | 97     | 97    | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1544   | -     | -     | 1506   | -    | -     | 801    | 736   | 973   | 807    | 733   | 1005  |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 913    | 817   | -     | 949    | 843   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 940    | 843   | -     | 910    | 815   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1544   | -     | -     | 1506   | -    | -     | 786    | 733   | 973   | 798    | 730   | 1005  |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 786    | 733   | -     | 798    | 730   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 910    | 815   | -     | 946    | 842   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 923    | 842   | -     | 900    | 813   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 0.3    |       |       | 0.1    |      |       | 9.6    |       |       | 9.3    |       |       |
| HCM LOS                  |        |       |       |        |      |       | A      |       |       | A      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 778    | 973   | 1544  | -      | -    | 1506  | -      | -     | 876   |        |       |       |
| HCM Lane V/C Ratio       | 0.029  | 0.004 | 0.003 | -      | -    | 0.001 | -      | -     | 0.035 |        |       |       |
| HCM Control Delay (s)    | 9.8    | 8.7   | 7.3   | 0      | -    | 7.4   | 0      | -     | 9.3   |        |       |       |
| HCM Lane LOS             | A      | A     | A     | A      | -    | A     | A      | -     | A     |        |       |       |
| HCM 95th %tile Q(veh)    | 0.1    | 0     | 0     | -      | -    | 0     | -      | -     | 0.1   |        |       |       |

## Intersection: 4: Wulfsohn Road &amp; Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 24  | 14  | 39 | 31  | 27   | 111 | 46  | 61 |
| Average Queue (ft)    | 2   | 0   | 8  | 4   | 1    | 39  | 14  | 23 |
| 95th Queue (ft)       | 14  | 8   | 31 | 20  | 17   | 82  | 40  | 53 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      |     |     |    |
| Queuing Penalty (veh) |     |     |    |     |      |     |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     | 0    |     | 0   | 0  |
| Queuing Penalty (veh) |     | 0   | 1  |     | 0    |     | 0   | 0  |

## Intersection: 13: Colorado Ave &amp; 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 187 | 134 | 95  | 71  |
| Average Queue (ft)    | 81  | 62  | 39  | 34  |
| 95th Queue (ft)       | 166 | 105 | 72  | 60  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 2   |     |     |     |
| Queuing Penalty (veh) | 4   |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

## Intersection: 15: 9th Street &amp; Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 65  | 74  | 69  |
| Average Queue (ft)    | 34  | 36  | 33  |
| 95th Queue (ft)       | 53  | 60  | 52  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

## Intersection: 16: 9th Street &amp; SH-82

| Movement              | EB | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 95 | 164 | 100 | 257 | 174 | 477 | 473 | 121 | 332 | 318 |
| Average Queue (ft)    | 49 | 52  | 46  | 114 | 47  | 405 | 376 | 23  | 127 | 114 |
| 95th Queue (ft)       | 95 | 120 | 104 | 222 | 144 | 553 | 556 | 73  | 264 | 251 |
| Link Distance (ft)    |    | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |     | 1   |     | 26  | 23  |     |     |     |
| Queuing Penalty (veh) |    | 1   |     | 0   |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 12 | 6   | 6   | 38  | 0   | 36  |     | 0   | 7   |     |
| Queuing Penalty (veh) | 8  | 3   | 7   | 13  | 0   | 17  |     | 0   | 2   |     |

## Intersection: 20: GMF/PnR &amp; Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 6   | 2    | 38  | 31  | 38  |
| Average Queue (ft)    | 0   | 0    | 14  | 4   | 18  |
| 95th Queue (ft)       | 4   | 2    | 40  | 22  | 43  |
| Link Distance (ft)    | 825 | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |



HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 2.6                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 31                                                                                | 958                                                                               | 133                                                                               | 7                                                                                 | 387                                                                               | 19   | 74   | 0                                                                                 | 8    | 7    | 4                                                                                   | 6                                                                                   |
| Future Vol, veh/h        | 31                                                                                | 958                                                                               | 133                                                                               | 7                                                                                 | 387                                                                               | 19   | 74   | 0                                                                                 | 8    | 7    | 4                                                                                   | 6                                                                                   |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 35                                                                                | 1076                                                                              | 149                                                                               | 8                                                                                 | 435                                                                               | 21   | 83   | 0                                                                                 | 9    | 8    | 4                                                                                   | 7                                                                                   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 456    | 0 | 0 | 1227   | 0 | 0 | 1616   | 1620  | 1078  | 1687   | 1759  | 447   |
| Stage 1              | -      | - | - | -      | - | - | 1148   | 1148  | -     | 462    | 462   | -     |
| Stage 2              | -      | - | - | -      | - | - | 468    | 472   | -     | 1225   | 1297  | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 1105   | - | - | 568    | - | - | ~ 83   | 103   | 266   | 74     | 85    | 612   |
| Stage 1              | -      | - | - | -      | - | - | 242    | 273   | -     | 580    | 565   | -     |
| Stage 2              | -      | - | - | -      | - | - | 575    | 559   | -     | 219    | 232   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 1105   | - | - | 567    | - | - | ~ 77   | 98    | 265   | 69     | 81    | 611   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 176    | 198   | -     | 156    | 170   | -     |
| Stage 1              | -      | - | - | -      | - | - | 234    | 264   | -     | 561    | 557   | -     |
| Stage 2              | -      | - | - | -      | - | - | 556    | 551   | -     | 205    | 224   | -     |

| Approach             | EB  |  |  | WB  |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 0.2 |  |  | 0.2 |  |  | 43.5 |  |  | 22.8 |  |  |
| HCM LOS              |     |  |  |     |  |  | E    |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h)      | 182   | 1105  | -   | -   | 567   | -   | -   | 161   | 611   |
| HCM Lane V/C Ratio    | 0.506 | 0.032 | -   | -   | 0.014 | -   | -   | 0.077 | 0.011 |
| HCM Control Delay (s) | 43.5  | 8.4   | -   | -   | 11.4  | -   | -   | 29.2  | 11    |
| HCM Lane LOS          | E     | A     | -   | -   | B     | -   | -   | D     | B     |
| HCM 95th %tile Q(veh) | 2.5   | 0.1   | -   | -   | 0     | -   | -   | 0.2   | 0     |

| Notes                      |  |  |                        |  |  |                            |  |  |                                |  |  |  |
|----------------------------|--|--|------------------------|--|--|----------------------------|--|--|--------------------------------|--|--|--|
| ~: Volume exceeds capacity |  |  | \$: Delay exceeds 300s |  |  | +: Computation Not Defined |  |  | *: All major volume in platoon |  |  |  |

Intersection

Intersection Delay, s/veh 15.9

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 15   | 223  | 72   | 127  | 238  | 76   | 56   | 18   | 19   | 20   | 26   | 29   |
| Future Vol, veh/h   | 15   | 223  | 72   | 127  | 238  | 76   | 56   | 18   | 19   | 20   | 26   | 29   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 17   | 259  | 84   | 148  | 277  | 88   | 65   | 21   | 22   | 23   | 30   | 34   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 13.5 | 19.6 | 10.8 | 10.3 |
| HCM LOS                    | B    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 60%   | 5%    | 29%   | 27%   |
| Vol Thru, %            | 19%   | 72%   | 54%   | 35%   |
| Vol Right, %           | 20%   | 23%   | 17%   | 39%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 93    | 310   | 441   | 75    |
| LT Vol                 | 56    | 15    | 127   | 20    |
| Through Vol            | 18    | 223   | 238   | 26    |
| RT Vol                 | 19    | 72    | 76    | 29    |
| Lane Flow Rate         | 108   | 360   | 513   | 87    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.189 | 0.513 | 0.714 | 0.149 |
| Departure Headway (Hd) | 6.283 | 5.125 | 5.013 | 6.167 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 570   | 703   | 723   | 579   |
| Service Time           | 4.341 | 3.165 | 3.048 | 4.229 |
| HCM Lane V/C Ratio     | 0.189 | 0.512 | 0.71  | 0.15  |
| HCM Control Delay      | 10.8  | 13.5  | 19.6  | 10.3  |
| HCM Lane LOS           | B     | B     | C     | B     |
| HCM 95th-tile Q        | 0.7   | 3     | 6.1   | 0.5   |

Intersection

Intersection Delay, s/veh 9.6

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 27   | 34   | 17   | 12   | 36   | 83   | 3    | 0    | 0    | 87   | 150  | 36   |
| Future Vol, veh/h   | 27   | 34   | 17   | 12   | 36   | 83   | 3    | 0    | 0    | 87   | 150  | 36   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 31   | 40   | 20   | 14   | 42   | 97   | 3    | 0    | 0    | 101  | 174  | 42   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB  | SB   |
|----------------------------|-----|-----|-----|------|
| Opposing Approach          | WB  | EB  | SB  | NB   |
| Opposing Lanes             | 1   | 1   | 1   | 1    |
| Conflicting Approach Left  | SB  | NB  | EB  | WB   |
| Conflicting Lanes Left     | 1   | 1   | 1   | 1    |
| Conflicting Approach Right | NB  | SB  | WB  | EB   |
| Conflicting Lanes Right    | 1   | 1   | 1   | 1    |
| HCM Control Delay          | 8.5 | 8.5 | 8.1 | 10.4 |
| HCM LOS                    | A   | A   | A   | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 9%    | 32%   |
| Vol Thru, %            | 0%    | 44%   | 27%   | 55%   |
| Vol Right, %           | 0%    | 22%   | 63%   | 13%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 3     | 78    | 131   | 273   |
| LT Vol                 | 3     | 27    | 12    | 87    |
| Through Vol            | 0     | 34    | 36    | 150   |
| RT Vol                 | 0     | 17    | 83    | 36    |
| Lane Flow Rate         | 3     | 91    | 152   | 317   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.005 | 0.121 | 0.188 | 0.395 |
| Departure Headway (Hd) | 5.071 | 4.808 | 4.442 | 4.484 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 704   | 745   | 807   | 803   |
| Service Time           | 3.117 | 2.845 | 2.474 | 2.514 |
| HCM Lane V/C Ratio     | 0.004 | 0.122 | 0.188 | 0.395 |
| HCM Control Delay      | 8.1   | 8.5   | 8.5   | 10.4  |
| HCM Lane LOS           | A     | A     | A     | B     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.7   | 1.9   |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 37                                                                                | 12                                                                                | 85                                                                                | 32                                                                                | 10                                                                                | 41                                                                                | 90                                                                                  | 1076                                                                                | 32                                                                                  | 19                                                                                  | 974                                                                                 | 35                                                                                  |
| Future Volume (veh/h)         | 37                                                                                | 12                                                                                | 85                                                                                | 32                                                                                | 10                                                                                | 41                                                                                | 90                                                                                  | 1076                                                                                | 32                                                                                  | 19                                                                                  | 974                                                                                 | 35                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.92                                                                              | 1.00                                                                              |                                                                                   | 0.90                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 38                                                                                | 12                                                                                | 88                                                                                | 33                                                                                | 10                                                                                | 42                                                                                | 93                                                                                  | 1109                                                                                | 33                                                                                  | 20                                                                                  | 1004                                                                                | 36                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 160                                                                               | 16                                                                                | 119                                                                               | 127                                                                               | 21                                                                                | 86                                                                                | 411                                                                                 | 2517                                                                                | 75                                                                                  | 362                                                                                 | 2461                                                                                | 88                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.07                                                                              | 0.07                                                                              | 0.07                                                                              | 0.03                                                                                | 0.72                                                                                | 0.72                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 72.7                                                                              | 0.0                                                                               | 88.7                                                                              | 75.8                                                                              | 0.0                                                                               | 79.4                                                                              | 8.1                                                                                 | 11.2                                                                                | 11.1                                                                                | 8.0                                                                                 | 11.4                                                                                | 11.4                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | E                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 138                                                                               |                                                                                   |                                                                                   | 85                                                                                |                                                                                   |                                                                                   | 1235                                                                                |                                                                                     |                                                                                     | 1060                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 84.3                                                                              |                                                                                   |                                                                                   | 78.0                                                                              |                                                                                   |                                                                                   | 10.9                                                                                |                                                                                     |                                                                                     | 11.3                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | F                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              |                                                                                   | 10.0                                                                              | 1.1                                                                                 |                                                                                     | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 7.6                                                                               |                                                                                   | 126.1                                                                             | 16.6                                                                              |                                                                                   | 19.8                                                                              | 9.4                                                                                 |                                                                                     | 124.2                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                                 |                                                                                     | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              |                                                                                   | 18.5                                                                              | 5.7                                                                                 |                                                                                     | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.3                                                                               | 5.0                                                                               |                                                                                   | 5.2                                                                               | 3.8                                                                                 |                                                                                     | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.5                                                                               |                                                                                   | 24.3                                                                              | 7.7                                                                               |                                                                                   | 13.0                                                                              | 4.5                                                                                 |                                                                                     | 22.3                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 10.5                                                                              | 0.2                                                                               |                                                                                   | 0.3                                                                               | 0.0                                                                                 |                                                                                     | 9.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.61                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 0.76                                                                              |                                                                                   | 0.00                                                                              | 0.01                                                                              |                                                                                   | 0.84                                                                              | 1.00                                                                                |                                                                                     | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              |                                                                                   | 1781                                                                              |                                                                                   | 1781                                                                              | 1781                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3520                                                                              |                                                                                   | 288                                                                               |                                                                                   | 180                                                                               | 3495                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 105                                                                               |                                                                                   | 1211                                                                              |                                                                                   | 1322                                                                              | 125                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                   |                                                                                     | 0                                                                                   | 0                                                                                   |                                                                                     | 0                                                                                   |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 20    | 0    | 33   | 38   | 93    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781  | 0    | 1781 | 1781 | 1781  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.5   | 0.0  | 3.0  | 3.4  | 2.5   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.5   | 0.0  | 3.0  | 3.4  | 2.5   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 493   | 0    | 1781 | 1781 | 542   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 119.7 | 0.0  | 0.0  | 0.0  | 119.7 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 99.3  | 0.0  | 0.0  | 0.0  | 99.4  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.9   | 0.0  | 0.0  | 0.0  | 4.2   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 362   | 0    | 127  | 160  | 411   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.06  | 0.00 | 0.26 | 0.24 | 0.23  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 398   | 0    | 196  | 194  | 419   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 7.9   | 0.0  | 74.7 | 71.9 | 7.9   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1   | 0.0  | 1.1  | 0.8  | 0.3   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 8.0   | 0.0  | 75.8 | 72.7 | 8.1   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.2   | 0.0  | 1.4  | 1.6  | 1.0   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.2   | 0.0  | 1.4  | 1.6  | 1.0   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.04  | 0.00 | 0.48 | 0.54 | 0.17  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |

### Middle Lane Group Data

|                             |      |      |      |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt               | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment             | T    |      |      |      | T    |      |      |      |
| Lanes in Grp                | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h          | 0    | 560  | 0    | 0    | 0    | 510  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln  | 0    | 1777 | 0    | 0    | 0    | 1777 | 0    | 0    |
| Q Serve Time (g_s), s       | 0.0  | 22.3 | 0.0  | 0.0  | 0.0  | 20.3 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s | 0.0  | 22.3 | 0.0  | 0.0  | 0.0  | 20.3 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h     | 0    | 1271 | 0    | 0    | 0    | 1251 | 0    | 0    |
| V/C Ratio (X)               | 0.00 | 0.44 | 0.00 | 0.00 | 0.00 | 0.41 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h      | 0    | 1271 | 0    | 0    | 0    | 1251 | 0    | 0    |
| Upstream Filter (I)         | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh   | 0.0  | 10.1 | 0.0  | 0.0  | 0.0  | 10.5 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh      | 0.0  | 1.1  | 0.0  | 0.0  | 0.0  | 0.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh    | 0.0  | 11.2 | 0.0  | 0.0  | 0.0  | 11.4 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln     | 0.0  | 8.6  | 0.0  | 0.0  | 0.0  | 8.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln     | 0.0  | 0.4  | 0.0  | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 9.0  | 0.0  | 0.0  | 0.0  | 8.3  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.53 | 0.00 | 0.00 | 0.00 | 0.51 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 582  | 52   | 100  | 0    | 530  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1848 | 1499 | 1503 | 0    | 1844 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 22.3 | 5.7  | 11.0 | 0.0  | 20.3 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 22.3 | 5.7  | 11.0 | 0.0  | 20.3 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.88 | 0.00 | 0.07 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1322 | 107  | 135  | 0    | 1298 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.44 | 0.49 | 0.74 | 0.00 | 0.41 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1322 | 165  | 164  | 0    | 1298 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 10.1 | 76.0 | 75.4 | 0.0  | 10.5 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.1  | 3.4  | 13.3 | 0.0  | 0.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 11.1 | 79.4 | 88.7 | 0.0  | 11.4 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 9.0  | 2.2  | 4.3  | 0.0  | 8.3  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.4  | 0.1  | 0.5  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 9.4  | 2.3  | 4.8  | 0.0  | 8.6  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.55 | 0.21 | 0.58 | 0.00 | 0.53 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 17.4 |
| HCM 6th LOS        | B    |



| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 3.6    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 21     | 45    | 33    | 41     | 120  | 39    | 38     | 0     | 11    | 17     | 3     | 14    |
| Future Vol, veh/h        | 21     | 45    | 33    | 41     | 120  | 39    | 38     | 0     | 11    | 17     | 3     | 14    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 23     | 49    | 36    | 45     | 130  | 42    | 41     | 0     | 12    | 18     | 3     | 15    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 172    | 0     | 0     | 85     | 0    | 0     | 363    | 375   | 67    | 360    | 372   | 151   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 113    | 113   | -     | 241    | 241   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 250    | 262   | -     | 119    | 131   | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1405   | -     | -     | 1512   | -    | -     | 593    | 556   | 997   | 596    | 558   | 895   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 892    | 802   | -     | 762    | 706   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 754    | 691   | -     | 885    | 788   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1405   | -     | -     | 1512   | -    | -     | 558    | 529   | 997   | 567    | 531   | 895   |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 558    | 529   | -     | 567    | 531   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 877    | 788   | -     | 749    | 683   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 713    | 668   | -     | 860    | 775   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 1.6    |       |       | 1.5    |      |       | 11.3   |       |       | 10.8   |       |       |
| HCM LOS                  |        |       |       |        |      |       | B      |       |       | B      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 558    | 997   | 1405  | -      | -    | 1512  | -      | -     | 663   |        |       |       |
| HCM Lane V/C Ratio       | 0.074  | 0.012 | 0.016 | -      | -    | 0.029 | -      | -     | 0.056 |        |       |       |
| HCM Control Delay (s)    | 12     | 8.7   | 7.6   | 0      | -    | 7.5   | 0      | -     | 10.8  |        |       |       |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -     | B     |        |       |       |
| HCM 95th %tile Q(veh)    | 0.2    | 0     | 0.1   | -      | -    | 0.1   | -      | -     | 0.2   |        |       |       |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 44  | 25  | 43 | 34  | 18   | 169 | 39  | 31 |
| Average Queue (ft)    | 9   | 1   | 12 | 5   | 1    | 63  | 9   | 5  |
| 95th Queue (ft)       | 32  | 16  | 38 | 24  | 9    | 134 | 32  | 24 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      |     |     |    |
| Queuing Penalty (veh) |     |     |    |     |      |     |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     |      |     |     |    |
| Queuing Penalty (veh) |     | 0   | 2  |     |      |     |     |    |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 215 | 162 | 72  | 79  |
| Average Queue (ft)    | 95  | 104 | 36  | 36  |
| 95th Queue (ft)       | 191 | 157 | 61  | 63  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 3   |     |     |     |
| Queuing Penalty (veh) | 7   |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 64  | 71  | 31  | 100 |
| Average Queue (ft)    | 32  | 39  | 4   | 49  |
| 95th Queue (ft)       | 57  | 62  | 21  | 79  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 98 | 164 | 82 | 127 | 174 | 364 | 314 | 116 | 346 | 321 |
| Average Queue (ft)    | 38 | 59  | 32 | 39  | 58  | 177 | 128 | 16  | 147 | 133 |
| 95th Queue (ft)       | 85 | 127 | 74 | 88  | 137 | 331 | 270 | 62  | 290 | 272 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |    |     |     | 0   |     |     | 0   |     |
| Queuing Penalty (veh) |    | 0   |    |     |     | 0   |     |     | 0   |     |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 7  | 9   | 6  | 3   |     | 10  |     |     | 10  |     |
| Queuing Penalty (veh) | 6  | 3   | 3  | 1   |     | 9   |     |     | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 31  | 27   | 57  | 34  | 40  |
| Average Queue (ft)    | 3   | 2    | 23  | 11  | 21  |
| 95th Queue (ft)       | 19  | 15   | 50  | 35  | 45  |
| Link Distance (ft)    | 825 | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh         | 8.6                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |      |                                                                                   |      |      |                                                                                     |                                                                                     |
| Movement                 | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations      |  |  |  |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h       | 5                                                                                 | 428                                                                               | 109                                                                               | 9                                                                                 | 882                                                                               | 11   | 139  | 1                                                                                 | 8    | 15   | 2                                                                                   | 30                                                                                  |
| Future Vol, veh/h        | 5                                                                                 | 428                                                                               | 109                                                                               | 9                                                                                 | 882                                                                               | 11   | 139  | 1                                                                                 | 8    | 15   | 2                                                                                   | 30                                                                                  |
| Conflicting Peds, #/hr   | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1    | 0                                                                                 | 0    | 0    | 0                                                                                   | 1                                                                                   |
| Sign Control             | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop | Stop                                                                              | Stop | Stop | Stop                                                                                | Stop                                                                                |
| RT Channelized           | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -    | -                                                                                 | None | -    | -                                                                                   | None                                                                                |
| Storage Length           | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -    | -                                                                                 | -    | -    | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, # | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 1                                                                                 | -    | -    | 1                                                                                   | -                                                                                   |
| Grade, %                 | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -    | 0                                                                                 | -    | -    | 0                                                                                   | -                                                                                   |
| Peak Hour Factor         | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89   | 89                                                                                | 89   | 89   | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %        | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                | 6                                                                                 | 481                                                                               | 122                                                                               | 10                                                                                | 991                                                                               | 12   | 156  | 1                                                                                 | 9    | 17   | 2                                                                                   | 34                                                                                  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 1003   | 0 | 0 | 605    | 0 | 0 | 1531   | 1518  | 483   | 1576   | 1634  | 998   |
| Stage 1              | -      | - | - | -      | - | - | 495    | 495   | -     | 1017   | 1017  | -     |
| Stage 2              | -      | - | - | -      | - | - | 1036   | 1023  | -     | 559    | 617   | -     |
| Critical Hdwy        | 4.12   | - | - | 4.12   | - | - | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy       | 2.218  | - | - | 2.218  | - | - | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver   | 690    | - | - | 973    | - | - | ~ 96   | 119   | 584   | 89     | 101   | 296   |
| Stage 1              | -      | - | - | -      | - | - | 556    | 546   | -     | 287    | 315   | -     |
| Stage 2              | -      | - | - | -      | - | - | 280    | 313   | -     | 513    | 481   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 690    | - | - | 971    | - | - | ~ 83   | 117   | 583   | 86     | 99    | 296   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 182    | 225   | -     | 200    | 213   | -     |
| Stage 1              | -      | - | - | -      | - | - | 550    | 540   | -     | 284    | 312   | -     |
| Stage 2              | -      | - | - | -      | - | - | 244    | 310   | -     | 500    | 476   | -     |

| Approach             | EB  |  |  | WB  |  |  | NB |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|----|--|--|------|--|--|
| HCM Control Delay, s | 0.1 |  |  | 0.1 |  |  | 88 |  |  | 20.9 |  |  |
| HCM LOS              |     |  |  |     |  |  | F  |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL  | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-----|-----|------|-----|-----|-------|-------|
| Capacity (veh/h)      | 189   | 690   | -   | -   | 971  | -   | -   | 201   | 296   |
| HCM Lane V/C Ratio    | 0.88  | 0.008 | -   | -   | 0.01 | -   | -   | 0.095 | 0.114 |
| HCM Control Delay (s) | 88    | 10.3  | -   | -   | 8.7  | -   | -   | 24.8  | 18.7  |
| HCM Lane LOS          | F     | B     | -   | -   | A    | -   | -   | C     | C     |
| HCM 95th %tile Q(veh) | 6.6   | 0     | -   | -   | 0    | -   | -   | 0.3   | 0.4   |

| Notes                      |  |  |                        |  |  |                            |  |  |                                |  |  |  |
|----------------------------|--|--|------------------------|--|--|----------------------------|--|--|--------------------------------|--|--|--|
| ~: Volume exceeds capacity |  |  | \$: Delay exceeds 300s |  |  | +: Computation Not Defined |  |  | *: All major volume in platoon |  |  |  |

Intersection

Intersection Delay, s/veh 12.1

Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 34   | 223  | 79   | 27   | 176  | 68   | 62   | 10   | 31   | 37   | 19   | 25   |
| Future Vol, veh/h   | 34   | 223  | 79   | 27   | 176  | 68   | 62   | 10   | 31   | 37   | 19   | 25   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 40   | 259  | 92   | 31   | 205  | 79   | 72   | 12   | 36   | 43   | 22   | 29   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB  |
|----------------------------|------|------|------|-----|
| Opposing Approach          | WB   | EB   | SB   | NB  |
| Opposing Lanes             | 1    | 1    | 1    | 1   |
| Conflicting Approach Left  | SB   | NB   | EB   | WB  |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1   |
| Conflicting Approach Right | NB   | SB   | WB   | EB  |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1   |
| HCM Control Delay          | 13.4 | 11.8 | 10.2 | 9.9 |
| HCM LOS                    | B    | B    | B    | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 60%   | 10%   | 10%   | 46%   |
| Vol Thru, %            | 10%   | 66%   | 65%   | 23%   |
| Vol Right, %           | 30%   | 24%   | 25%   | 31%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 103   | 336   | 271   | 81    |
| LT Vol                 | 62    | 34    | 27    | 37    |
| Through Vol            | 10    | 223   | 176   | 19    |
| RT Vol                 | 31    | 79    | 68    | 25    |
| Lane Flow Rate         | 120   | 391   | 315   | 94    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.193 | 0.533 | 0.435 | 0.152 |
| Departure Headway (Hd) | 5.787 | 4.908 | 4.964 | 5.811 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 619   | 738   | 725   | 616   |
| Service Time           | 3.835 | 2.908 | 2.997 | 3.861 |
| HCM Lane V/C Ratio     | 0.194 | 0.53  | 0.434 | 0.153 |
| HCM Control Delay      | 10.2  | 13.4  | 11.8  | 9.9   |
| HCM Lane LOS           | B     | B     | B     | A     |
| HCM 95th-tile Q        | 0.7   | 3.2   | 2.2   | 0.5   |

Intersection

Intersection Delay, s/veh 8.2

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 14   | 68   | 17   | 19   | 49   | 59   | 0    | 0    | 0    | 69   | 38   | 18   |
| Future Vol, veh/h   | 14   | 68   | 17   | 19   | 49   | 59   | 0    | 0    | 0    | 69   | 38   | 18   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 16   | 79   | 20   | 22   | 57   | 69   | 0    | 0    | 0    | 80   | 44   | 21   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB | NB | SB  |
|----------------------------|-----|----|----|-----|
| Opposing Approach          | WB  | EB | SB | NB  |
| Opposing Lanes             | 1   | 1  | 1  | 1   |
| Conflicting Approach Left  | SB  | NB | EB | WB  |
| Conflicting Lanes Left     | 1   | 1  | 1  | 1   |
| Conflicting Approach Right | NB  | SB | WB | EB  |
| Conflicting Lanes Right    | 1   | 1  | 1  | 1   |
| HCM Control Delay          | 8.1 | 8  | 0  | 8.6 |
| HCM LOS                    | A   | A  | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 15%   | 55%   |
| Vol Thru, %            | 100%  | 69%   | 39%   | 30%   |
| Vol Right, %           | 0%    | 17%   | 46%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 99    | 127   | 125   |
| LT Vol                 | 0     | 14    | 19    | 69    |
| Through Vol            | 0     | 68    | 49    | 38    |
| RT Vol                 | 0     | 17    | 59    | 18    |
| Lane Flow Rate         | 0     | 115   | 148   | 145   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.139 | 0.171 | 0.183 |
| Departure Headway (Hd) | 4.682 | 4.36  | 4.158 | 4.529 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 824   | 865   | 794   |
| Service Time           | 2.707 | 2.376 | 2.172 | 2.548 |
| HCM Lane V/C Ratio     | 0     | 0.14  | 0.171 | 0.183 |
| HCM Control Delay      | 7.7   | 8.1   | 8     | 8.6   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.5   | 0.6   | 0.7   |



# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 50                                                                                | 13                                                                                | 67                                                                                | 33                                                                                | 17                                                                                | 97                                                                                | 63                                                                                  | 1842                                                                                | 16                                                                                  | 25                                                                                  | 895                                                                                 | 25                                                                                  |
| Future Volume (veh/h)         | 50                                                                                | 13                                                                                | 67                                                                                | 33                                                                                | 17                                                                                | 97                                                                                | 63                                                                                  | 1842                                                                                | 16                                                                                  | 25                                                                                  | 895                                                                                 | 25                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.92                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 52                                                                                | 13                                                                                | 69                                                                                | 34                                                                                | 18                                                                                | 100                                                                               | 65                                                                                  | 1899                                                                                | 16                                                                                  | 26                                                                                  | 923                                                                                 | 26                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 148                                                                               | 20                                                                                | 105                                                                               | 171                                                                               | 22                                                                                | 124                                                                               | 433                                                                                 | 2506                                                                                | 21                                                                                  | 162                                                                                 | 2422                                                                                | 68                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.03                                                                                | 0.69                                                                                | 0.69                                                                                | 0.02                                                                                | 0.69                                                                                | 0.69                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 75.0                                                                              | 0.0                                                                               | 81.3                                                                              | 71.3                                                                              | 0.0                                                                               | 97.3                                                                              | 8.5                                                                                 | 21.1                                                                                | 21.0                                                                                | 18.4                                                                                | 12.2                                                                                | 12.1                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | C                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 134                                                                               |                                                                                   |                                                                                   | 152                                                                               |                                                                                   |                                                                                   | 1980                                                                                |                                                                                     |                                                                                     | 975                                                                                 |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.9                                                                              |                                                                                   |                                                                                   | 91.5                                                                              |                                                                                   |                                                                                   | 20.7                                                                                |                                                                                     |                                                                                     | 12.3                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              |                                                                                   | 10.0                                                                              | 1.1                                                                                 |                                                                                     | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 8.0                                                                               |                                                                                   | 122.5                                                                             | 20.9                                                                              |                                                                                   | 18.6                                                                              | 9.3                                                                                 |                                                                                     | 121.3                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                                 |                                                                                     | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              |                                                                                   | 18.5                                                                              | 5.7                                                                                 |                                                                                     | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.2                                                                               | 5.3                                                                               |                                                                                   | 5.0                                                                               | 3.8                                                                                 |                                                                                     | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.7                                                                               |                                                                                   | 59.9                                                                              | 14.9                                                                              |                                                                                   | 11.0                                                                              | 3.8                                                                                 |                                                                                     | 20.9                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 26.3                                                                              | 0.2                                                                               |                                                                                   | 0.3                                                                               | 0.0                                                                                 |                                                                                     | 7.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.71                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              |                                                                                   | 0.18                                                                              | 1.00                                                                                |                                                                                     | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              |                                                                                   | 1781                                                                              |                                                                                   | 1781                                                                              | 1781                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3610                                                                              |                                                                                   | 232                                                                               |                                                                                   | 239                                                                               | 3527                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 30                                                                                |                                                                                   | 1289                                                                              |                                                                                   | 1268                                                                              | 99                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                   |                                                                                     | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 26    | 0    | 34   | 52   | 65    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781  | 0    | 1781 | 1781 | 1781  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.7   | 0.0  | 3.0  | 4.7  | 1.8   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.7   | 0.0  | 3.0  | 4.7  | 1.8   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 234   | 0    | 1781 | 1781 | 591   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 116.8 | 0.0  | 0.0  | 0.0  | 116.8 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 60.1  | 0.0  | 0.0  | 0.0  | 97.9  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 7.1   | 0.0  | 0.0  | 0.0  | 2.3   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 162   | 0    | 171  | 148  | 433   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.16  | 0.00 | 0.20 | 0.35 | 0.15  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 193   | 0    | 196  | 194  | 442   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 18.0  | 0.0  | 70.8 | 73.6 | 8.4   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.4   | 0.0  | 0.6  | 1.4  | 0.2   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 18.4  | 0.0  | 71.3 | 75.0 | 8.5   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.4   | 0.0  | 1.4  | 2.2  | 0.7   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.4   | 0.0  | 1.4  | 2.2  | 0.7   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.08  | 0.00 | 0.48 | 0.75 | 0.12  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |

### Middle Lane Group Data

|                             |      |      |      |      |      |      |      |      |
|-----------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt               | 0    | 2    | 8    | 4    | 0    | 6    | 0    | 0    |
| Lane Assignment             | T    |      |      |      | T    |      |      |      |
| Lanes in Grp                | 0    | 1    | 0    | 0    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h          | 0    | 933  | 0    | 0    | 0    | 465  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln  | 0    | 1777 | 0    | 0    | 0    | 1777 | 0    | 0    |
| Q Serve Time (g_s), s       | 0.0  | 57.5 | 0.0  | 0.0  | 0.0  | 18.9 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s | 0.0  | 57.5 | 0.0  | 0.0  | 0.0  | 18.9 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h     | 0    | 1233 | 0    | 0    | 0    | 1220 | 0    | 0    |
| V/C Ratio (X)               | 0.00 | 0.76 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h      | 0    | 1233 | 0    | 0    | 0    | 1220 | 0    | 0    |
| Upstream Filter (I)         | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh   | 0.0  | 16.8 | 0.0  | 0.0  | 0.0  | 11.3 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh      | 0.0  | 4.4  | 0.0  | 0.0  | 0.0  | 0.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh    | 0.0  | 21.1 | 0.0  | 0.0  | 0.0  | 12.2 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln     | 0.0  | 22.8 | 0.0  | 0.0  | 0.0  | 7.5  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln     | 0.0  | 1.5  | 0.0  | 0.0  | 0.0  | 0.3  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 24.3 | 0.0  | 0.0  | 0.0  | 7.8  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.42 | 0.00 | 0.00 | 0.00 | 0.48 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 982  | 118  | 82   | 0    | 484  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1864 | 1521 | 1507 | 0    | 1849 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 57.9 | 12.9 | 9.0  | 0.0  | 18.9 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 57.9 | 12.9 | 9.0  | 0.0  | 18.9 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.84 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1294 | 146  | 125  | 0    | 1270 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.76 | 0.81 | 0.66 | 0.00 | 0.38 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1294 | 167  | 164  | 0    | 1270 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 16.8 | 75.3 | 75.6 | 0.0  | 11.3 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 4.2  | 22.0 | 5.7  | 0.0  | 0.8  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 21.0 | 97.3 | 81.3 | 0.0  | 12.1 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 24.0 | 5.1  | 3.5  | 0.0  | 7.8  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.5  | 0.9  | 0.2  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 25.5 | 6.0  | 3.7  | 0.0  | 8.1  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.50 | 0.55 | 0.45 | 0.00 | 0.50 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 23.9 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 4.9    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 18     | 83    | 15    | 7      | 67   | 10    | 67     | 3     | 20    | 27     | 4     | 27    |
| Future Vol, veh/h        | 18     | 83    | 15    | 7      | 67   | 10    | 67     | 3     | 20    | 27     | 4     | 27    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 20     | 90    | 16    | 8      | 73   | 11    | 73     | 3     | 22    | 29     | 4     | 29    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 84     | 0     | 0     | 106    | 0    | 0     | 249    | 238   | 98    | 246    | 241   | 79    |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 138    | 138   | -     | 95     | 95    | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 111    | 100   | -     | 151    | 146   | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1513   | -     | -     | 1485   | -    | -     | 705    | 663   | 958   | 708    | 660   | 981   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 865    | 782   | -     | 912    | 816   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 894    | 812   | -     | 851    | 776   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1513   | -     | -     | 1485   | -    | -     | 670    | 650   | 958   | 679    | 647   | 981   |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 670    | 650   | -     | 679    | 647   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 853    | 771   | -     | 899    | 811   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 857    | 807   | -     | 817    | 765   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 1.1    |       |       | 0.6    |      |       | 10.6   |       |       | 10     |       |       |
| HCM LOS                  |        |       |       |        |      |       | B      |       |       | B      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 669    | 958   | 1513  | -      | -    | 1485  | -      | -     | 789   |        |       |       |
| HCM Lane V/C Ratio       | 0.114  | 0.023 | 0.013 | -      | -    | 0.005 | -      | -     | 0.08  |        |       |       |
| HCM Control Delay (s)    | 11.1   | 8.8   | 7.4   | 0      | -    | 7.4   | 0      | -     | 10    |        |       |       |
| HCM Lane LOS             | B      | A     | A     | A      | -    | A     | A      | -     | B     |        |       |       |
| HCM 95th %tile Q(veh)    | 0.4    | 0.1   | 0     | -      | -    | 0     | -      | -     | 0.3   |        |       |       |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 28  | 13  | 43 | 28  | 47   | 258 | 45  | 70 |
| Average Queue (ft)    | 3   | 1   | 9  | 4   | 2    | 110 | 14  | 25 |
| 95th Queue (ft)       | 17  | 10  | 35 | 20  | 24   | 239 | 41  | 56 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      |     |     |    |
| Queuing Penalty (veh) |     |     |    |     |      |     |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 0  |     | 0    |     | 0   | 1  |
| Queuing Penalty (veh) |     | 0   | 1  |     | 0    |     | 0   | 0  |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 200 | 125 | 100 | 95  |
| Average Queue (ft)    | 96  | 65  | 42  | 37  |
| 95th Queue (ft)       | 186 | 106 | 79  | 71  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 2   |     |     |     |
| Queuing Penalty (veh) | 5   |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 63  | 70  | 64  |
| Average Queue (ft)    | 35  | 38  | 34  |
| 95th Queue (ft)       | 56  | 60  | 51  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 97 | 167 | 100 | 219 | 174 | 469 | 469 | 132 | 320 | 303 |
| Average Queue (ft)    | 52 | 60  | 37  | 108 | 54  | 403 | 376 | 27  | 134 | 123 |
| 95th Queue (ft)       | 98 | 138 | 91  | 200 | 151 | 548 | 554 | 81  | 263 | 247 |
| Link Distance (ft)    |    | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 1   |     | 0   |     | 25  | 21  |     |     |     |
| Queuing Penalty (veh) |    | 1   |     | 0   |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75 |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 13 | 9   | 4   | 34  | 0   | 35  |     |     | 8   |     |
| Queuing Penalty (veh) | 11 | 4   | 4   | 11  | 0   | 22  |     |     | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 23  | 9    | 65  | 40  | 62  |
| Average Queue (ft)    | 2   | 1    | 31  | 16  | 29  |
| 95th Queue (ft)       | 14  | 7    | 55  | 42  | 56  |
| Link Distance (ft)    | 825 | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |



HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |          |                                                                                   |       |        |                                                                                     |                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|----------|-----------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh           | 47.1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Movement                   | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR  | NBL      | NBT                                                                               | NBR   | SBL    | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |  |  |  |  |  |      |          |  |       |        |  |  |
| Traffic Vol, veh/h         | 40                                                                                | 969                                                                               | 195                                                                               | 7                                                                                 | 414                                                                               | 28   | 236      | 0                                                                                 | 8     | 13     | 4                                                                                   | 12                                                                                  |
| Future Vol, veh/h          | 40                                                                                | 969                                                                               | 195                                                                               | 7                                                                                 | 414                                                                               | 28   | 236      | 0                                                                                 | 8     | 13     | 4                                                                                   | 12                                                                                  |
| Conflicting Peds, #/hr     | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0    | 1        | 0                                                                                 | 0     | 0      | 0                                                                                   | 1                                                                                   |
| Sign Control               | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free | Stop     | Stop                                                                              | Stop  | Stop   | Stop                                                                                | Stop                                                                                |
| RT Channelized             | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None | -        | -                                                                                 | None  | -      | -                                                                                   | None                                                                                |
| Storage Length             | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -    | -        | -                                                                                 | -     | -      | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, #   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -        | 1                                                                                 | -     | -      | 1                                                                                   | -                                                                                   |
| Grade, %                   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -        | 0                                                                                 | -     | -      | 0                                                                                   | -                                                                                   |
| Peak Hour Factor           | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89   | 89       | 89                                                                                | 89    | 89     | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2    | 2        | 2                                                                                 | 2     | 2      | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                  | 45                                                                                | 1089                                                                              | 219                                                                               | 8                                                                                 | 465                                                                               | 31   | 265      | 0                                                                                 | 9     | 15     | 4                                                                                   | 13                                                                                  |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Major/Minor                | Major1                                                                            |                                                                                   |                                                                                   | Major2                                                                            |                                                                                   |      | Minor1   |                                                                                   |       | Minor2 |                                                                                     |                                                                                     |
| Conflicting Flow All       | 496                                                                               | 0                                                                                 | 0                                                                                 | 1310                                                                              | 0                                                                                 | 0    | 1687     | 1693                                                                              | 1091  | 1790   | 1897                                                                                | 482                                                                                 |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | 1181     | 1181                                                                              | -     | 497    | 497                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | 506      | 512                                                                               | -     | 1293   | 1400                                                                                | -                                                                                   |
| Critical Hdwy              | 4.12                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                              | -                                                                                 | -    | 7.12     | 6.52                                                                              | 6.22  | 7.12   | 6.52                                                                                | 6.22                                                                                |
| Critical Hdwy Stg 1        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | 6.12     | 5.52                                                                              | -     | 6.12   | 5.52                                                                                | -                                                                                   |
| Critical Hdwy Stg 2        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | 6.12     | 5.52                                                                              | -     | 6.12   | 5.52                                                                                | -                                                                                   |
| Follow-up Hdwy             | 2.218                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                             | -                                                                                 | -    | 3.518    | 4.018                                                                             | 3.318 | 3.518  | 4.018                                                                               | 3.318                                                                               |
| Pot Cap-1 Maneuver         | 1068                                                                              | -                                                                                 | -                                                                                 | 528                                                                               | -                                                                                 | -    | ~ 74     | 93                                                                                | 261   | 63     | 69                                                                                  | 584                                                                                 |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | ~ 232    | 264                                                                               | -     | 555    | 545                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | 549      | 536                                                                               | -     | 200    | 207                                                                                 | -                                                                                   |
| Platoon blocked, %         |                                                                                   | -                                                                                 | -                                                                                 |                                                                                   | -                                                                                 | -    |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Mov Cap-1 Maneuver         | 1068                                                                              | -                                                                                 | -                                                                                 | 527                                                                               | -                                                                                 | -    | ~ 67     | 88                                                                                | 261   | 58     | 65                                                                                  | 583                                                                                 |
| Mov Cap-2 Maneuver         | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | ~ 164    | 186                                                                               | -     | 140    | 150                                                                                 | -                                                                                   |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | ~ 222    | 252                                                                               | -     | 532    | 537                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -    | 523      | 528                                                                               | -     | 185    | 198                                                                                 | -                                                                                   |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Approach                   | EB                                                                                |                                                                                   |                                                                                   | WB                                                                                |                                                                                   |      | NB       |                                                                                   |       | SB     |                                                                                     |                                                                                     |
| HCM Control Delay, s       | 0.3                                                                               |                                                                                   |                                                                                   | 0.2                                                                               |                                                                                   |      | \$ 367.2 |                                                                                   |       | 24.8   |                                                                                     |                                                                                     |
| HCM LOS                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      | F        |                                                                                   |       | C      |                                                                                     |                                                                                     |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt      | NBLn1                                                                             | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT  | WBR      | SBLn1                                                                             | SBLn2 |        |                                                                                     |                                                                                     |
| Capacity (veh/h)           | 166                                                                               | 1068                                                                              | -                                                                                 | -                                                                                 | 527                                                                               | -    | -        | 142                                                                               | 583   |        |                                                                                     |                                                                                     |
| HCM Lane V/C Ratio         | 1.652                                                                             | 0.042                                                                             | -                                                                                 | -                                                                                 | 0.015                                                                             | -    | -        | 0.135                                                                             | 0.023 |        |                                                                                     |                                                                                     |
| HCM Control Delay (s)      | \$ 367.2                                                                          | 8.5                                                                               | -                                                                                 | -                                                                                 | 11.9                                                                              | -    | -        | 34.3                                                                              | 11.3  |        |                                                                                     |                                                                                     |
| HCM Lane LOS               | F                                                                                 | A                                                                                 | -                                                                                 | -                                                                                 | B                                                                                 | -    | -        | D                                                                                 | B     |        |                                                                                     |                                                                                     |
| HCM 95th %tile Q(veh)      | 18.9                                                                              | 0.1                                                                               | -                                                                                 | -                                                                                 | 0                                                                                 | -    | -        | 0.5                                                                               | 0.1   |        |                                                                                     |                                                                                     |
| Notes                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |      |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity |                                                                                   | \$: Delay exceeds 300s                                                            |                                                                                   | +: Computation Not Defined                                                        |                                                                                   |      |          | *: All major volume in platoon                                                    |       |        |                                                                                     |                                                                                     |

Intersection

Intersection Delay, s/veh 31.7

Intersection LOS D

| Movement            | EBL  | EBT                                                                               | EBR  | WBL  | WBT                                                                               | WBR  | NBL  | NBT                                                                               | NBR  | SBL  | SBT                                                                                 | SBR  |
|---------------------|------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|------|
| Lane Configurations |      |  |      |      |  |      |      |  |      |      |  |      |
| Traffic Vol, veh/h  | 15   | 403                                                                               | 72   | 127  | 305                                                                               | 76   | 56   | 18                                                                                | 19   | 20   | 26                                                                                  | 29   |
| Future Vol, veh/h   | 15   | 403                                                                               | 72   | 127  | 305                                                                               | 76   | 56   | 18                                                                                | 19   | 20   | 26                                                                                  | 29   |
| Peak Hour Factor    | 0.86 | 0.86                                                                              | 0.86 | 0.86 | 0.86                                                                              | 0.86 | 0.86 | 0.86                                                                              | 0.86 | 0.86 | 0.86                                                                                | 0.86 |
| Heavy Vehicles, %   | 2    | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                 | 2    | 2    | 2                                                                                   | 2    |
| Mvmt Flow           | 17   | 469                                                                               | 84   | 148  | 355                                                                               | 88   | 65   | 21                                                                                | 22   | 23   | 30                                                                                  | 34   |
| Number of Lanes     | 0    | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 0    | 1                                                                                 | 0    | 0    | 1                                                                                   | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 32.7 | 37.2 | 12.2 | 11.6 |
| HCM LOS                    | D    | E    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 60%   | 3%    | 25%   | 27%   |
| Vol Thru, %            | 19%   | 82%   | 60%   | 35%   |
| Vol Right, %           | 20%   | 15%   | 15%   | 39%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 93    | 490   | 508   | 75    |
| LT Vol                 | 56    | 15    | 127   | 20    |
| Through Vol            | 18    | 403   | 305   | 26    |
| RT Vol                 | 19    | 72    | 76    | 29    |
| Lane Flow Rate         | 108   | 570   | 591   | 87    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.217 | 0.858 | 0.892 | 0.173 |
| Departure Headway (Hd) | 7.231 | 5.424 | 5.435 | 7.151 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 499   | 661   | 662   | 504   |
| Service Time           | 5.238 | 3.516 | 3.524 | 5.158 |
| HCM Lane V/C Ratio     | 0.216 | 0.862 | 0.893 | 0.173 |
| HCM Control Delay      | 12.2  | 32.7  | 37.2  | 11.6  |
| HCM Lane LOS           | B     | D     | E     | B     |
| HCM 95th-tile Q        | 0.8   | 9.8   | 11    | 0.6   |

Intersection

Intersection Delay, s/veh 9.6

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 27   | 34   | 17   | 12   | 36   | 83   | 3    | 0    | 0    | 87   | 150  | 36   |
| Future Vol, veh/h   | 27   | 34   | 17   | 12   | 36   | 83   | 3    | 0    | 0    | 87   | 150  | 36   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 31   | 40   | 20   | 14   | 42   | 97   | 3    | 0    | 0    | 101  | 174  | 42   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB  | SB   |
|----------------------------|-----|-----|-----|------|
| Opposing Approach          | WB  | EB  | SB  | NB   |
| Opposing Lanes             | 1   | 1   | 1   | 1    |
| Conflicting Approach Left  | SB  | NB  | EB  | WB   |
| Conflicting Lanes Left     | 1   | 1   | 1   | 1    |
| Conflicting Approach Right | NB  | SB  | WB  | EB   |
| Conflicting Lanes Right    | 1   | 1   | 1   | 1    |
| HCM Control Delay          | 8.5 | 8.5 | 8.1 | 10.4 |
| HCM LOS                    | A   | A   | A   | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 100%  | 35%   | 9%    | 32%   |
| Vol Thru, %            | 0%    | 44%   | 27%   | 55%   |
| Vol Right, %           | 0%    | 22%   | 63%   | 13%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 3     | 78    | 131   | 273   |
| LT Vol                 | 3     | 27    | 12    | 87    |
| Through Vol            | 0     | 34    | 36    | 150   |
| RT Vol                 | 0     | 17    | 83    | 36    |
| Lane Flow Rate         | 3     | 91    | 152   | 317   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.005 | 0.121 | 0.188 | 0.395 |
| Departure Headway (Hd) | 5.071 | 4.808 | 4.442 | 4.484 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 704   | 745   | 807   | 803   |
| Service Time           | 3.117 | 2.845 | 2.474 | 2.514 |
| HCM Lane V/C Ratio     | 0.004 | 0.122 | 0.188 | 0.395 |
| HCM Control Delay      | 8.1   | 8.5   | 8.5   | 10.4  |
| HCM Lane LOS           | A     | A     | A     | B     |
| HCM 95th-tile Q        | 0     | 0.4   | 0.7   | 1.9   |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 37                                                                                | 12                                                                                | 85                                                                                | 32                                                                                | 10                                                                                | 41                                                                                | 90                                                                                  | 1105                                                                                | 32                                                                                  | 19                                                                                  | 1042                                                                                | 35                                                                                  |
| Future Volume (veh/h)         | 37                                                                                | 12                                                                                | 85                                                                                | 32                                                                                | 10                                                                                | 41                                                                                | 90                                                                                  | 1105                                                                                | 32                                                                                  | 19                                                                                  | 1042                                                                                | 35                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.92                                                                              | 1.00                                                                              |                                                                                   | 0.90                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 38                                                                                | 12                                                                                | 88                                                                                | 33                                                                                | 10                                                                                | 42                                                                                | 93                                                                                  | 1139                                                                                | 33                                                                                  | 20                                                                                  | 1074                                                                                | 36                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 160                                                                               | 16                                                                                | 119                                                                               | 127                                                                               | 21                                                                                | 86                                                                                | 385                                                                                 | 2520                                                                                | 73                                                                                  | 352                                                                                 | 2467                                                                                | 83                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.09                                                                              | 0.09                                                                              | 0.09                                                                              | 0.07                                                                              | 0.07                                                                              | 0.07                                                                              | 0.03                                                                                | 0.72                                                                                | 0.72                                                                                | 0.02                                                                                | 0.70                                                                                | 0.70                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 72.7                                                                              | 0.0                                                                               | 88.7                                                                              | 75.8                                                                              | 0.0                                                                               | 79.4                                                                              | 8.5                                                                                 | 11.4                                                                                | 11.3                                                                                | 8.1                                                                                 | 11.8                                                                                | 11.8                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | E                                                                                 | A                                                                                   | B                                                                                   | B                                                                                   | A                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 138                                                                               |                                                                                   |                                                                                   | 85                                                                                |                                                                                   |                                                                                   | 1265                                                                                |                                                                                     |                                                                                     | 1130                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 84.3                                                                              |                                                                                   |                                                                                   | 78.0                                                                              |                                                                                   |                                                                                   | 11.1                                                                                |                                                                                     |                                                                                     | 11.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | F                                                                                 |                                                                                   |                                                                                   | E                                                                                 |                                                                                   |                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              |                                                                                   | 10.0                                                                              | 1.1                                                                                 |                                                                                     | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 7.6                                                                               |                                                                                   | 126.1                                                                             | 16.6                                                                              |                                                                                   | 19.8                                                                              | 9.4                                                                                 |                                                                                     | 124.2                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                                 |                                                                                     | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              |                                                                                   | 18.5                                                                              | 5.7                                                                                 |                                                                                     | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.3                                                                               | 5.0                                                                               |                                                                                   | 5.2                                                                               | 3.8                                                                                 |                                                                                     | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.5                                                                               |                                                                                   | 25.1                                                                              | 7.7                                                                               |                                                                                   | 13.0                                                                              | 4.5                                                                                 |                                                                                     | 24.2                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 11.0                                                                              | 0.2                                                                               |                                                                                   | 0.3                                                                               | 0.0                                                                                 |                                                                                     | 10.0                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.61                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 0.99                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 0.76                                                                              |                                                                                   | 0.00                                                                              | 0.01                                                                              |                                                                                   | 0.84                                                                              | 1.00                                                                                |                                                                                     | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              |                                                                                   | 1781                                                                              |                                                                                   | 1781                                                                              | 1781                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3524                                                                              |                                                                                   | 288                                                                               |                                                                                   | 180                                                                               | 3505                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 102                                                                               |                                                                                   | 1211                                                                              |                                                                                   | 1322                                                                              | 117                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                   |                                                                                     | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 20    | 0    | 33   | 38   | 93    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781  | 0    | 1781 | 1781 | 1781  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.5   | 0.0  | 3.0  | 3.4  | 2.5   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.5   | 0.0  | 3.0  | 3.4  | 2.5   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 479   | 0    | 1781 | 1781 | 508   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 119.7 | 0.0  | 0.0  | 0.0  | 119.7 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 98.4  | 0.0  | 0.0  | 0.0  | 97.4  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 0.9   | 0.0  | 0.0  | 0.0  | 5.0   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 352   | 0    | 127  | 160  | 385   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.06  | 0.00 | 0.26 | 0.24 | 0.24  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 388   | 0    | 196  | 194  | 393   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 8.0   | 0.0  | 74.7 | 71.9 | 8.2   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.1   | 0.0  | 1.1  | 0.8  | 0.3   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 8.1   | 0.0  | 75.8 | 72.7 | 8.5   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.2   | 0.0  | 1.4  | 1.6  | 1.0   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.2   | 0.0  | 1.4  | 1.6  | 1.0   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.04  | 0.00 | 0.48 | 0.54 | 0.17  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      | T    |       |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 574  | 0    | 0    | 0     | 544  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1777 | 0    | 0    | 0     | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 23.1 | 0.0  | 0.0  | 0.0   | 22.2 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 23.1 | 0.0  | 0.0  | 0.0   | 22.2 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1271 | 0    | 0    | 0     | 1251 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.45 | 0.00 | 0.00 | 0.00  | 0.44 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1271 | 0    | 0    | 0     | 1251 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 10.2 | 0.0  | 0.0  | 0.0   | 10.7 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 1.2  | 0.0  | 0.0  | 0.0   | 1.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 11.4 | 0.0  | 0.0  | 0.0   | 11.8 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 9.0  | 0.0  | 0.0  | 0.0   | 8.7  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.4  | 0.0  | 0.0  | 0.0   | 0.4  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 9.4  | 0.0  | 0.0  | 0.0  | 9.1  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.56 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 598  | 52   | 100  | 0    | 566  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1849 | 1499 | 1503 | 0    | 1845 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 23.1 | 5.7  | 11.0 | 0.0  | 22.2 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 23.1 | 5.7  | 11.0 | 0.0  | 22.2 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.06 | 0.81 | 0.88 | 0.00 | 0.06 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1322 | 107  | 135  | 0    | 1299 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.45 | 0.49 | 0.74 | 0.00 | 0.44 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1322 | 165  | 164  | 0    | 1299 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 10.2 | 76.0 | 75.4 | 0.0  | 10.7 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 1.1  | 3.4  | 13.3 | 0.0  | 1.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 11.3 | 79.4 | 88.7 | 0.0  | 11.8 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 9.3  | 2.2  | 4.3  | 0.0  | 9.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 0.4  | 0.1  | 0.5  | 0.0  | 0.4  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 9.8  | 2.3  | 4.8  | 0.0  | 9.4  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 0.57 | 0.21 | 0.58 | 0.00 | 0.58 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 17.4 |
| HCM 6th LOS        | B    |



| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 2.7    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 21     | 137   | 33    | 41     | 262  | 39    | 38     | 0     | 11    | 17     | 3     | 14    |
| Future Vol, veh/h        | 21     | 137   | 33    | 41     | 262  | 39    | 38     | 0     | 11    | 17     | 3     | 14    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 23     | 149   | 36    | 45     | 285  | 42    | 41     | 0     | 12    | 18     | 3     | 15    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 327    | 0     | 0     | 185    | 0    | 0     | 618    | 630   | 167   | 615    | 627   | 306   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 213    | 213   | -     | 396    | 396   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 405    | 417   | -     | 219    | 231   | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1233   | -     | -     | 1390   | -    | -     | 402    | 399   | 877   | 403    | 400   | 734   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 789    | 726   | -     | 629    | 604   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 622    | 591   | -     | 783    | 713   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1233   | -     | -     | 1390   | -    | -     | 373    | 375   | 877   | 379    | 376   | 734   |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 373    | 375   | -     | 379    | 376   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 772    | 711   | -     | 616    | 580   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 581    | 567   | -     | 756    | 698   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 0.9    |       |       | 0.9    |      |       | 14.4   |       |       | 13.3   |       |       |
| HCM LOS                  |        |       |       |        |      |       | B      |       |       | B      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 373    | 877   | 1233  | -      | -    | 1390  | -      | -     | -     | 473    |       |       |
| HCM Lane V/C Ratio       | 0.111  | 0.014 | 0.019 | -      | -    | 0.032 | -      | -     | -     | 0.078  |       |       |
| HCM Control Delay (s)    | 15.9   | 9.2   | 8     | 0      | -    | 7.7   | 0      | -     | -     | 13.3   |       |       |
| HCM Lane LOS             | C      | A     | A     | A      | -    | A     | A      | -     | -     | B      |       |       |
| HCM 95th %tile Q(veh)    | 0.4    | 0     | 0.1   | -      | -    | 0.1   | -      | -     | -     | 0.3    |       |       |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 42  | 22  | 43 | 38  | 10   | 840 | 45  | 36 |
| Average Queue (ft)    | 12  | 1   | 20 | 6   | 0    | 808 | 15  | 10 |
| 95th Queue (ft)       | 35  | 17  | 47 | 27  | 6    | 953 | 41  | 34 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 70  |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 219 |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  |     | 0   | 1  |     |      |     |     |    |
| Queuing Penalty (veh) |     | 0   | 5  |     |      |     |     |    |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 227 | 192 | 72  | 73  |
| Average Queue (ft)    | 167 | 128 | 36  | 35  |
| 95th Queue (ft)       | 240 | 188 | 64  | 63  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 5   | 0   |     |     |
| Queuing Penalty (veh) | 12  | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 59  | 73  | 31  | 93  |
| Average Queue (ft)    | 31  | 41  | 4   | 49  |
| 95th Queue (ft)       | 52  | 66  | 20  | 78  |
| Link Distance (ft)    | 501 | 211 | 418 | 404 |
| Upstream Blk Time (%) |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB | EB  | WB | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|----|-----|----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L  | TR  | L  | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 97 | 182 | 94 | 124 | 161 | 380 | 316 | 95  | 337 | 336 |
| Average Queue (ft)    | 38 | 66  | 34 | 41  | 56  | 192 | 143 | 16  | 156 | 141 |
| 95th Queue (ft)       | 86 | 138 | 76 | 91  | 132 | 341 | 279 | 57  | 306 | 287 |
| Link Distance (ft)    |    | 211 |    | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |    | 0   |    |     |     | 0   | 0   |     | 0   | 0   |
| Queuing Penalty (veh) |    | 0   |    |     |     | 0   | 0   |     | 0   | 0   |
| Storage Bay Dist (ft) | 75 |     | 75 |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 6  | 14  | 4  | 5   | 0   | 10  |     |     | 10  |     |
| Queuing Penalty (veh) | 5  | 5   | 2  | 2   | 0   | 9   |     |     | 2   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 28  | 1535 | 299 | 126 | 203 |
| Average Queue (ft)    | 2   | 1080 | 150 | 22  | 92  |
| 95th Queue (ft)       | 16  | 2015 | 329 | 134 | 230 |
| Link Distance (ft)    | 825 | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |     | 50   | 13  | 2   | 14  |
| Queuing Penalty (veh) |     | 0    | 0   | 0   | 0   |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |

HCM 6th TWSC  
4: Wulfsohn Road & Midland Ave

08/08/2023

| Intersection               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                |          |                                                                                   |       |        |                                                                                     |                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------|----------|-----------------------------------------------------------------------------------|-------|--------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Int Delay, s/veh           | 97.8                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Movement                   | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                            | NBL      | NBT                                                                               | NBR   | SBL    | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations        |  |  |  |  |  |                                |          |  |       |        |  |  |
| Traffic Vol, veh/h         | 37                                                                                | 459                                                                               | 172                                                                               | 9                                                                                 | 905                                                                               | 43                             | 257      | 1                                                                                 | 9     | 44     | 2                                                                                   | 59                                                                                  |
| Future Vol, veh/h          | 37                                                                                | 459                                                                               | 172                                                                               | 9                                                                                 | 905                                                                               | 43                             | 257      | 1                                                                                 | 9     | 44     | 2                                                                                   | 59                                                                                  |
| Conflicting Peds, #/hr     | 0                                                                                 | 0                                                                                 | 2                                                                                 | 2                                                                                 | 0                                                                                 | 0                              | 1        | 0                                                                                 | 0     | 0      | 0                                                                                   | 1                                                                                   |
| Sign Control               | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                                                                              | Free                           | Stop     | Stop                                                                              | Stop  | Stop   | Stop                                                                                | Stop                                                                                |
| RT Channelized             | -                                                                                 | -                                                                                 | None                                                                              | -                                                                                 | -                                                                                 | None                           | -        | -                                                                                 | None  | -      | -                                                                                   | None                                                                                |
| Storage Length             | 100                                                                               | -                                                                                 | 25                                                                                | 150                                                                               | -                                                                                 | -                              | -        | -                                                                                 | -     | -      | -                                                                                   | 75                                                                                  |
| Veh in Median Storage, #   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                              | -        | 1                                                                                 | -     | -      | 1                                                                                   | -                                                                                   |
| Grade, %                   | -                                                                                 | 0                                                                                 | -                                                                                 | -                                                                                 | 0                                                                                 | -                              | -        | 0                                                                                 | -     | -      | 0                                                                                   | -                                                                                   |
| Peak Hour Factor           | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                                                                                | 89                             | 89       | 89                                                                                | 89    | 89     | 89                                                                                  | 89                                                                                  |
| Heavy Vehicles, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                              | 2        | 2                                                                                 | 2     | 2      | 2                                                                                   | 2                                                                                   |
| Mvmt Flow                  | 42                                                                                | 516                                                                               | 193                                                                               | 10                                                                                | 1017                                                                              | 48                             | 289      | 1                                                                                 | 10    | 49     | 2                                                                                   | 66                                                                                  |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Major/Minor                | Major1                                                                            |                                                                                   |                                                                                   | Major2                                                                            |                                                                                   |                                | Minor1   |                                                                                   |       | Minor2 |                                                                                     |                                                                                     |
| Conflicting Flow All       | 1065                                                                              | 0                                                                                 | 0                                                                                 | 711                                                                               | 0                                                                                 | 0                              | 1698     | 1687                                                                              | 518   | 1763   | 1856                                                                                | 1042                                                                                |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | 602      | 602                                                                               | -     | 1061   | 1061                                                                                | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | 1096     | 1085                                                                              | -     | 702    | 795                                                                                 | -                                                                                   |
| Critical Hdwy              | 4.12                                                                              | -                                                                                 | -                                                                                 | 4.12                                                                              | -                                                                                 | -                              | 7.12     | 6.52                                                                              | 6.22  | 7.12   | 6.52                                                                                | 6.22                                                                                |
| Critical Hdwy Stg 1        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | 6.12     | 5.52                                                                              | -     | 6.12   | 5.52                                                                                | -                                                                                   |
| Critical Hdwy Stg 2        | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | 6.12     | 5.52                                                                              | -     | 6.12   | 5.52                                                                                | -                                                                                   |
| Follow-up Hdwy             | 2.218                                                                             | -                                                                                 | -                                                                                 | 2.218                                                                             | -                                                                                 | -                              | 3.518    | 4.018                                                                             | 3.318 | 3.518  | 4.018                                                                               | 3.318                                                                               |
| Pot Cap-1 Maneuver         | 654                                                                               | -                                                                                 | -                                                                                 | 888                                                                               | -                                                                                 | -                              | ~ 73     | 94                                                                                | 558   | 66     | 74                                                                                  | 279                                                                                 |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | 486      | 489                                                                               | -     | 271    | 300                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | ~ 259    | 293                                                                               | -     | 429    | 399                                                                                 | -                                                                                   |
| Platoon blocked, %         |                                                                                   | -                                                                                 | -                                                                                 |                                                                                   | -                                                                                 | -                              |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Mov Cap-1 Maneuver         | 654                                                                               | -                                                                                 | -                                                                                 | 886                                                                               | -                                                                                 | -                              | ~ 52     | 87                                                                                | 557   | 61     | 68                                                                                  | 279                                                                                 |
| Mov Cap-2 Maneuver         | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | ~ 121    | 182                                                                               | -     | 166    | 180                                                                                 | -                                                                                   |
| Stage 1                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | 454      | 457                                                                               | -     | 254    | 297                                                                                 | -                                                                                   |
| Stage 2                    | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                                                                                 | -                              | ~ 194    | 290                                                                               | -     | 393    | 373                                                                                 | -                                                                                   |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                |          |                                                                                   |       |        |                                                                                     |                                                                                     |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Approach                   | EB                                                                                |                                                                                   |                                                                                   | WB                                                                                |                                                                                   |                                | NB       |                                                                                   |       | SB     |                                                                                     |                                                                                     |
| HCM Control Delay, s       | 0.6                                                                               |                                                                                   |                                                                                   | 0.1                                                                               |                                                                                   |                                | \$ 718.9 |                                                                                   |       | 28     |                                                                                     |                                                                                     |
| HCM LOS                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                | F        |                                                                                   |       | D      |                                                                                     |                                                                                     |
|                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| Minor Lane/Major Mvmt      | NBLn1                                                                             | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                            | WBR      | SBLn1                                                                             | SBLn2 |        |                                                                                     |                                                                                     |
| Capacity (veh/h)           | 124                                                                               | 654                                                                               | -                                                                                 | -                                                                                 | 886                                                                               | -                              | -        | 167                                                                               | 279   |        |                                                                                     |                                                                                     |
| HCM Lane V/C Ratio         | 2.419                                                                             | 0.064                                                                             | -                                                                                 | -                                                                                 | 0.011                                                                             | -                              | -        | 0.309                                                                             | 0.238 |        |                                                                                     |                                                                                     |
| HCM Control Delay (s)      | \$ 718.9                                                                          | 10.9                                                                              | -                                                                                 | -                                                                                 | 9.1                                                                               | -                              | -        | 35.9                                                                              | 21.9  |        |                                                                                     |                                                                                     |
| HCM Lane LOS               | F                                                                                 | B                                                                                 | -                                                                                 | -                                                                                 | A                                                                                 | -                              | -        | E                                                                                 | C     |        |                                                                                     |                                                                                     |
| HCM 95th %tile Q(veh)      | 26.3                                                                              | 0.2                                                                               | -                                                                                 | -                                                                                 | 0                                                                                 | -                              | -        | 1.2                                                                               | 0.9   |        |                                                                                     |                                                                                     |
| Notes                      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                |          |                                                                                   |       |        |                                                                                     |                                                                                     |
| ~: Volume exceeds capacity |                                                                                   | \$: Delay exceeds 300s                                                            |                                                                                   | +: Computation Not Defined                                                        |                                                                                   | *: All major volume in platoon |          |                                                                                   |       |        |                                                                                     |                                                                                     |

Intersection

Intersection Delay, s/veh 27.7

Intersection LOS D

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 34   | 371  | 79   | 27   | 375  | 68   | 62   | 10   | 31   | 37   | 19   | 25   |
| Future Vol, veh/h   | 34   | 371  | 79   | 27   | 375  | 68   | 62   | 10   | 31   | 37   | 19   | 25   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 40   | 431  | 92   | 31   | 436  | 79   | 72   | 12   | 36   | 43   | 22   | 29   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 31.7 | 29.7 | 12.3 | 11.8 |
| HCM LOS                    | D    | D    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 60%   | 7%    | 6%    | 46%   |
| Vol Thru, %            | 10%   | 77%   | 80%   | 23%   |
| Vol Right, %           | 30%   | 16%   | 14%   | 31%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 103   | 484   | 470   | 81    |
| LT Vol                 | 62    | 34    | 27    | 37    |
| Through Vol            | 10    | 371   | 375   | 19    |
| RT Vol                 | 31    | 79    | 68    | 25    |
| Lane Flow Rate         | 120   | 563   | 547   | 94    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.236 | 0.849 | 0.829 | 0.187 |
| Departure Headway (Hd) | 7.088 | 5.43  | 5.458 | 7.161 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 509   | 658   | 656   | 504   |
| Service Time           | 5.095 | 3.526 | 3.556 | 5.17  |
| HCM Lane V/C Ratio     | 0.236 | 0.856 | 0.834 | 0.187 |
| HCM Control Delay      | 12.3  | 31.7  | 29.7  | 11.8  |
| HCM Lane LOS           | B     | D     | D     | B     |
| HCM 95th-tile Q        | 0.9   | 9.5   | 8.9   | 0.7   |

Intersection

Intersection Delay, s/veh 8.2

Intersection LOS A

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↔    |      |      | ↔    |      |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h  | 14   | 68   | 17   | 19   | 49   | 59   | 0    | 0    | 0    | 69   | 38   | 18   |
| Future Vol, veh/h   | 14   | 68   | 17   | 19   | 49   | 59   | 0    | 0    | 0    | 69   | 38   | 18   |
| Peak Hour Factor    | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, %   | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |
| Mvmt Flow           | 16   | 79   | 20   | 22   | 57   | 69   | 0    | 0    | 0    | 80   | 44   | 21   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB | NB | SB  |
|----------------------------|-----|----|----|-----|
| Opposing Approach          | WB  | EB | SB | NB  |
| Opposing Lanes             | 1   | 1  | 1  | 1   |
| Conflicting Approach Left  | SB  | NB | EB | WB  |
| Conflicting Lanes Left     | 1   | 1  | 1  | 1   |
| Conflicting Approach Right | NB  | SB | WB | EB  |
| Conflicting Lanes Right    | 1   | 1  | 1  | 1   |
| HCM Control Delay          | 8.1 | 8  | 0  | 8.6 |
| HCM LOS                    | A   | A  | -  | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 0%    | 14%   | 15%   | 55%   |
| Vol Thru, %            | 100%  | 69%   | 39%   | 30%   |
| Vol Right, %           | 0%    | 17%   | 46%   | 14%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 0     | 99    | 127   | 125   |
| LT Vol                 | 0     | 14    | 19    | 69    |
| Through Vol            | 0     | 68    | 49    | 38    |
| RT Vol                 | 0     | 17    | 59    | 18    |
| Lane Flow Rate         | 0     | 115   | 148   | 145   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0     | 0.139 | 0.171 | 0.183 |
| Departure Headway (Hd) | 4.682 | 4.36  | 4.158 | 4.529 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 0     | 824   | 865   | 794   |
| Service Time           | 2.707 | 2.376 | 2.172 | 2.548 |
| HCM Lane V/C Ratio     | 0     | 0.14  | 0.171 | 0.183 |
| HCM Control Delay      | 7.7   | 8.1   | 8     | 8.6   |
| HCM Lane LOS           | N     | A     | A     | A     |
| HCM 95th-tile Q        | 0     | 0.5   | 0.6   | 0.7   |



# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                               |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Movement                      | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
| Lane Configurations           |  |  |                                                                                   |  |  |                                                                                   |  |  |                                                                                     |  |  |  |
| Traffic Volume (veh/h)        | 53                                                                                | 13                                                                                | 67                                                                                | 33                                                                                | 17                                                                                | 97                                                                                | 63                                                                                  | 1925                                                                                | 16                                                                                  | 25                                                                                  | 958                                                                                 | 25                                                                                  |
| Future Volume (veh/h)         | 53                                                                                | 13                                                                                | 67                                                                                | 33                                                                                | 17                                                                                | 97                                                                                | 63                                                                                  | 1925                                                                                | 16                                                                                  | 25                                                                                  | 958                                                                                 | 25                                                                                  |
| Number                        | 7                                                                                 | 4                                                                                 | 14                                                                                | 3                                                                                 | 8                                                                                 | 18                                                                                | 5                                                                                   | 2                                                                                   | 12                                                                                  | 1                                                                                   | 6                                                                                   | 16                                                                                  |
| Initial Q, veh                | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |
| Ped-Bike Adj (A_pbT)          | 1.00                                                                              |                                                                                   | 0.92                                                                              | 1.00                                                                              |                                                                                   | 0.93                                                                              | 1.00                                                                                |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.97                                                                                |
| Parking Bus Adj               | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Work Zone On Approach         | No                                                                                |                                                                                   |                                                                                   | No                                                                                |                                                                                   |                                                                                   | No                                                                                  |                                                                                     |                                                                                     | No                                                                                  |                                                                                     |                                                                                     |
| Lanes Open During Work Zone   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Adj Sat Flow, veh/h/ln        | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                              | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                | 1870                                                                                |
| Adj Flow Rate, veh/h          | 55                                                                                | 13                                                                                | 69                                                                                | 34                                                                                | 18                                                                                | 100                                                                               | 65                                                                                  | 1985                                                                                | 16                                                                                  | 26                                                                                  | 988                                                                                 | 26                                                                                  |
| Peak Hour Factor              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Percent Heavy Veh, %          | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   |
| Opposing Right Turn Influence | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                               |                                                                                   |                                                                                   | Yes                                                                                 |                                                                                     |                                                                                     | Yes                                                                                 |                                                                                     |                                                                                     |
| Cap, veh/h                    | 148                                                                               | 20                                                                                | 105                                                                               | 171                                                                               | 22                                                                                | 124                                                                               | 407                                                                                 | 2507                                                                                | 20                                                                                  | 148                                                                                 | 2427                                                                                | 64                                                                                  |
| HCM Platoon Ratio             | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Prop Arrive On Green          | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.10                                                                              | 0.10                                                                              | 0.10                                                                              | 0.03                                                                                | 0.69                                                                                | 0.69                                                                                | 0.02                                                                                | 0.69                                                                                | 0.69                                                                                |
| Unsig. Movement Delay         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Ln Grp Delay, s/veh           | 75.3                                                                              | 0.0                                                                               | 81.3                                                                              | 71.3                                                                              | 0.0                                                                               | 97.3                                                                              | 8.8                                                                                 | 22.9                                                                                | 22.8                                                                                | 21.0                                                                                | 12.5                                                                                | 12.5                                                                                |
| Ln Grp LOS                    | E                                                                                 | A                                                                                 | F                                                                                 | E                                                                                 | A                                                                                 | F                                                                                 | A                                                                                   | C                                                                                   | C                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |
| Approach Vol, veh/h           | 137                                                                               |                                                                                   |                                                                                   | 152                                                                               |                                                                                   |                                                                                   | 2066                                                                                |                                                                                     |                                                                                     | 1040                                                                                |                                                                                     |                                                                                     |
| Approach Delay, s/veh         | 78.9                                                                              |                                                                                   |                                                                                   | 91.5                                                                              |                                                                                   |                                                                                   | 22.4                                                                                |                                                                                     |                                                                                     | 12.7                                                                                |                                                                                     |                                                                                     |
| Approach LOS                  | E                                                                                 |                                                                                   |                                                                                   | F                                                                                 |                                                                                   |                                                                                   | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Timer:                        | 1                                                                                 | 2                                                                                 | 3                                                                                 | 4                                                                                 | 5                                                                                 | 6                                                                                 | 7                                                                                   | 8                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Phs                  | 1                                                                                 |                                                                                   | 2                                                                                 | 8                                                                                 |                                                                                   | 4                                                                                 | 5                                                                                   |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Case No                       | 1.1                                                                               |                                                                                   | 4.0                                                                               | 10.0                                                                              |                                                                                   | 10.0                                                                              | 1.1                                                                                 |                                                                                     | 4.0                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Phs Duration (G+Y+Rc), s      | 8.0                                                                               |                                                                                   | 122.5                                                                             | 20.9                                                                              |                                                                                   | 18.6                                                                              | 9.3                                                                                 |                                                                                     | 121.3                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Change Period (Y+Rc), s       | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                               |                                                                                   | 4.5                                                                               | 4.5                                                                                 |                                                                                     | 4.5                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Green (Gmax), s           | 6.5                                                                               |                                                                                   | 108.3                                                                             | 18.7                                                                              |                                                                                   | 18.5                                                                              | 5.7                                                                                 |                                                                                     | 109.1                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Max Allow Headway (MAH), s    | 3.8                                                                               |                                                                                   | 5.2                                                                               | 5.3                                                                               |                                                                                   | 4.9                                                                               | 3.8                                                                                 |                                                                                     | 5.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Max Q Clear (g_c+I1), s       | 2.7                                                                               |                                                                                   | 65.7                                                                              | 14.9                                                                              |                                                                                   | 11.0                                                                              | 3.8                                                                                 |                                                                                     | 22.7                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Green Ext Time (g_e), s       | 0.0                                                                               |                                                                                   | 26.4                                                                              | 0.2                                                                               |                                                                                   | 0.3                                                                               | 0.0                                                                                 |                                                                                     | 8.6                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Prob of Phs Call (p_c)        | 0.71                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Prob of Max Out (p_x)         | 1.00                                                                              |                                                                                   | 0.00                                                                              | 1.00                                                                              |                                                                                   | 0.18                                                                              | 1.00                                                                                |                                                                                     | 0.00                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Left-Turn Movement Data       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 1781                                                                              |                                                                                   | 1781                                                                              |                                                                                   | 1781                                                                              | 1781                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Through Movement Data         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 2                                                                                 |                                                                                   | 8                                                                                 |                                                                                   | 4                                                                                 | 6                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 3612                                                                              |                                                                                   | 232                                                                               |                                                                                   | 239                                                                               | 3534                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right-Turn Movement Data      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 12                                                                                |                                                                                   | 18                                                                                |                                                                                   | 14                                                                                | 16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Mvmt Sat Flow, veh/h          | 29                                                                                |                                                                                   | 1289                                                                              |                                                                                   | 1268                                                                              | 93                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Left Lane Group Data          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Assigned Mvmt                 | 1                                                                                 |                                                                                   | 0                                                                                 | 3                                                                                 |                                                                                   | 7                                                                                 | 5                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   |                                                                                     |                                                                                     |
| Lane Assignment               | L (Pr/Pm)                                                                         |                                                                                   | L                                                                                 |                                                                                   | LL (Pr/Pm)                                                                        |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

2043 BG + RFTA + GMMTS PM 2:56 pm 08/02/2023

Synchro 11 Report  
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# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                                     |       |      |      |      |       |      |      |      |
|-------------------------------------|-------|------|------|------|-------|------|------|------|
| Lanes in Grp                        | 1     | 0    | 1    | 1    | 1     | 0    | 0    | 0    |
| Grp Vol (v), veh/h                  | 26    | 0    | 34   | 55   | 65    | 0    | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 1781  | 0    | 1781 | 1781 | 1781  | 0    | 0    | 0    |
| Q Serve Time (g_s), s               | 0.7   | 0.0  | 3.0  | 5.0  | 1.8   | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.7   | 0.0  | 3.0  | 5.0  | 1.8   | 0.0  | 0.0  | 0.0  |
| Perm LT Sat Flow (s_l), veh/h/ln    | 215   | 0    | 1781 | 1781 | 556   | 0    | 0    | 0    |
| Shared LT Sat Flow (s_sh), veh/h/ln | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Perm LT Eff Green (g_p), s          | 116.8 | 0.0  | 0.0  | 0.0  | 116.8 | 0.0  | 0.0  | 0.0  |
| Perm LT Serve Time (g_u), s         | 54.3  | 0.0  | 0.0  | 0.0  | 96.1  | 0.0  | 0.0  | 0.0  |
| Perm LT Q Serve Time (g_ps), s      | 8.6   | 0.0  | 0.0  | 0.0  | 2.7   | 0.0  | 0.0  | 0.0  |
| Time to First Blk (g_f), s          | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Serve Time pre Blk (g_fs), s        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Prop LT Inside Lane (P_L)           | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h             | 148   | 0    | 171  | 148  | 407   | 0    | 0    | 0    |
| V/C Ratio (X)                       | 0.18  | 0.00 | 0.20 | 0.37 | 0.16  | 0.00 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 179   | 0    | 196  | 194  | 416   | 0    | 0    | 0    |
| Upstream Filter (I)                 | 0.95  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 20.4  | 0.0  | 70.8 | 73.7 | 8.6   | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.5   | 0.0  | 0.6  | 1.5  | 0.2   | 0.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 21.0  | 0.0  | 71.3 | 75.3 | 8.8   | 0.0  | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.4   | 0.0  | 1.4  | 2.3  | 0.7   | 0.0  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 0.0  | 0.0  | 0.1  | 0.0   | 0.0  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln             | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)        | 1.00  | 0.00 | 1.00 | 1.00 | 1.00  | 0.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln        | 0.4   | 0.0  | 1.4  | 2.4  | 0.7   | 0.0  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)            | 0.09  | 0.00 | 0.48 | 0.80 | 0.12  | 0.00 | 0.00 | 0.00 |
| Initial Q (Qb), veh                 | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh               | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                     | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h                 | 0     | 0    | 0    | 0    | 0     | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h        | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| <b>Middle Lane Group Data</b>       |       |      |      |      |       |      |      |      |
| Assigned Mvmt                       | 0     | 2    | 8    | 4    | 0     | 6    | 0    | 0    |
| Lane Assignment                     | T     |      |      | T    |       |      |      |      |
| Lanes in Grp                        | 0     | 1    | 0    | 0    | 0     | 1    | 0    | 0    |
| Grp Vol (v), veh/h                  | 0     | 975  | 0    | 0    | 0     | 497  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln          | 0     | 1777 | 0    | 0    | 0     | 1777 | 0    | 0    |
| Q Serve Time (g_s), s               | 0.0   | 63.2 | 0.0  | 0.0  | 0.0   | 20.7 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s         | 0.0   | 63.2 | 0.0  | 0.0  | 0.0   | 20.7 | 0.0  | 0.0  |
| Lane Grp Cap (c), veh/h             | 0     | 1233 | 0    | 0    | 0     | 1220 | 0    | 0    |
| V/C Ratio (X)                       | 0.00  | 0.79 | 0.00 | 0.00 | 0.00  | 0.41 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h              | 0     | 1233 | 0    | 0    | 0     | 1220 | 0    | 0    |
| Upstream Filter (I)                 | 0.00  | 1.00 | 0.00 | 0.00 | 0.00  | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh           | 0.0   | 17.6 | 0.0  | 0.0  | 0.0   | 11.6 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh              | 0.0   | 5.2  | 0.0  | 0.0  | 0.0   | 1.0  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh         | 0.0   | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh            | 0.0   | 22.9 | 0.0  | 0.0  | 0.0   | 12.5 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln             | 0.0   | 25.0 | 0.0  | 0.0  | 0.0   | 8.2  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln             | 0.0   | 1.8  | 0.0  | 0.0  | 0.0   | 0.3  | 0.0  | 0.0  |

# HCM 6th Signalized Intersection Capacity Analysis

## 16: 9th Street & SH-82

08/08/2023

|                              |      |      |      |      |      |      |      |      |
|------------------------------|------|------|------|------|------|------|------|------|
| 3rd-Term Q (Q3), veh/ln      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%) | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln | 0.0  | 26.8 | 0.0  | 0.0  | 0.0  | 8.5  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)     | 0.00 | 1.57 | 0.00 | 0.00 | 0.00 | 0.53 | 0.00 | 0.00 |
| Initial Q (Qb), veh          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh        | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Right Lane Group Data

|                                  |      |      |      |      |      |      |      |      |
|----------------------------------|------|------|------|------|------|------|------|------|
| Assigned Mvmt                    | 0    | 12   | 18   | 14   | 0    | 16   | 0    | 0    |
| Lane Assignment                  |      | T+R  | T+R  | T+R  |      | T+R  |      |      |
| Lanes in Grp                     | 0    | 1    | 1    | 1    | 0    | 1    | 0    | 0    |
| Grp Vol (v), veh/h               | 0    | 1026 | 118  | 82   | 0    | 517  | 0    | 0    |
| Grp Sat Flow (s), veh/h/ln       | 0    | 1864 | 1521 | 1507 | 0    | 1851 | 0    | 0    |
| Q Serve Time (g_s), s            | 0.0  | 63.7 | 12.9 | 9.0  | 0.0  | 20.7 | 0.0  | 0.0  |
| Cycle Q Clear Time (g_c), s      | 0.0  | 63.7 | 12.9 | 9.0  | 0.0  | 20.7 | 0.0  | 0.0  |
| Prot RT Sat Flow (s_R), veh/h/ln | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prot RT Eff Green (g_R), s       | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop RT Outside Lane (P_R)       | 0.00 | 0.02 | 0.85 | 0.84 | 0.00 | 0.05 | 0.00 | 0.00 |
| Lane Grp Cap (c), veh/h          | 0    | 1294 | 146  | 125  | 0    | 1271 | 0    | 0    |
| V/C Ratio (X)                    | 0.00 | 0.79 | 0.81 | 0.65 | 0.00 | 0.41 | 0.00 | 0.00 |
| Avail Cap (c_a), veh/h           | 0    | 1294 | 167  | 164  | 0    | 1271 | 0    | 0    |
| Upstream Filter (I)              | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 |
| Uniform Delay (d1), s/veh        | 0.0  | 17.7 | 75.3 | 75.6 | 0.0  | 11.6 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh           | 0.0  | 5.1  | 22.0 | 5.7  | 0.0  | 0.9  | 0.0  | 0.0  |
| Initial Q Delay (d3), s/veh      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Control Delay (d), s/veh         | 0.0  | 22.8 | 97.3 | 81.3 | 0.0  | 12.5 | 0.0  | 0.0  |
| 1st-Term Q (Q1), veh/ln          | 0.0  | 26.4 | 5.1  | 3.5  | 0.0  | 8.6  | 0.0  | 0.0  |
| 2nd-Term Q (Q2), veh/ln          | 0.0  | 1.8  | 0.9  | 0.2  | 0.0  | 0.3  | 0.0  | 0.0  |
| 3rd-Term Q (Q3), veh/ln          | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile Back of Q Factor (f_B%)     | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| %ile Back of Q (50%), veh/ln     | 0.0  | 28.2 | 6.0  | 3.7  | 0.0  | 8.9  | 0.0  | 0.0  |
| %ile Storage Ratio (RQ%)         | 0.00 | 1.66 | 0.55 | 0.45 | 0.00 | 0.55 | 0.00 | 0.00 |
| Initial Q (Qb), veh              | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Final (Residual) Q (Qe), veh     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Delay (ds), s/veh            | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Q (Qs), veh                  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Sat Cap (cs), veh/h              | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Initial Q Clear Time (tc), h     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |

### Intersection Summary

|                    |      |
|--------------------|------|
| HCM 6th Ctrl Delay | 24.8 |
| HCM 6th LOS        | C    |

| Intersection             |        |       |       |        |      |       |        |       |       |        |       |       |
|--------------------------|--------|-------|-------|--------|------|-------|--------|-------|-------|--------|-------|-------|
| Int Delay, s/veh         | 3.4    |       |       |        |      |       |        |       |       |        |       |       |
| Movement                 | EBL    | EBT   | EBR   | WBL    | WBT  | WBR   | NBL    | NBT   | NBR   | SBL    | SBT   | SBR   |
| Lane Configurations      |        | ↕     |       |        | ↕    |       |        | ↕     | ↕     |        | ↕     |       |
| Traffic Vol, veh/h       | 18     | 242   | 15    | 7      | 204  | 10    | 67     | 3     | 20    | 27     | 4     | 27    |
| Future Vol, veh/h        | 18     | 242   | 15    | 7      | 204  | 10    | 67     | 3     | 20    | 27     | 4     | 27    |
| Conflicting Peds, #/hr   | 0      | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0     | 0      | 0     | 0     |
| Sign Control             | Free   | Free  | Free  | Free   | Free | Free  | Stop   | Stop  | Stop  | Stop   | Stop  | Stop  |
| RT Channelized           | -      | -     | None  | -      | -    | None  | -      | -     | None  | -      | -     | None  |
| Storage Length           | -      | -     | -     | -      | -    | -     | -      | -     | 0     | -      | -     | -     |
| Veh in Median Storage, # | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Grade, %                 | -      | 0     | -     | -      | 0    | -     | -      | 0     | -     | -      | 0     | -     |
| Peak Hour Factor         | 92     | 92    | 92    | 92     | 92   | 92    | 92     | 92    | 92    | 92     | 92    | 92    |
| Heavy Vehicles, %        | 2      | 2     | 2     | 2      | 2    | 2     | 2      | 2     | 2     | 2      | 2     | 2     |
| Mvmt Flow                | 20     | 263   | 16    | 8      | 222  | 11    | 73     | 3     | 22    | 29     | 4     | 29    |
| Major/Minor              | Major1 |       |       | Major2 |      |       | Minor1 |       |       | Minor2 |       |       |
| Conflicting Flow All     | 233    | 0     | 0     | 279    | 0    | 0     | 571    | 560   | 271   | 568    | 563   | 228   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 311    | 311   | -     | 244    | 244   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 260    | 249   | -     | 324    | 319   | -     |
| Critical Hdwy            | 4.12   | -     | -     | 4.12   | -    | -     | 7.12   | 6.52  | 6.22  | 7.12   | 6.52  | 6.22  |
| Critical Hdwy Stg 1      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Critical Hdwy Stg 2      | -      | -     | -     | -      | -    | -     | 6.12   | 5.52  | -     | 6.12   | 5.52  | -     |
| Follow-up Hdwy           | 2.218  | -     | -     | 2.218  | -    | -     | 3.518  | 4.018 | 3.318 | 3.518  | 4.018 | 3.318 |
| Pot Cap-1 Maneuver       | 1335   | -     | -     | 1284   | -    | -     | 432    | 437   | 768   | 434    | 435   | 811   |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 699    | 658   | -     | 760    | 704   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 745    | 701   | -     | 688    | 653   | -     |
| Platoon blocked, %       | -      | -     | -     | -      | -    | -     | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver       | 1335   | -     | -     | 1284   | -    | -     | 405    | 426   | 768   | 411    | 424   | 811   |
| Mov Cap-2 Maneuver       | -      | -     | -     | -      | -    | -     | 405    | 426   | -     | 411    | 424   | -     |
| Stage 1                  | -      | -     | -     | -      | -    | -     | 686    | 646   | -     | 746    | 699   | -     |
| Stage 2                  | -      | -     | -     | -      | -    | -     | 709    | 696   | -     | 653    | 641   | -     |
| Approach                 | EB     |       |       | WB     |      |       | NB     |       |       | SB     |       |       |
| HCM Control Delay, s     | 0.5    |       |       | 0.2    |      |       | 14.5   |       |       | 12.6   |       |       |
| HCM LOS                  |        |       |       |        |      |       | B      |       |       | B      |       |       |
| Minor Lane/Major Mvmt    | NBLn1  | NBLn2 | EBL   | EBT    | EBR  | WBL   | WBT    | WBR   | SBLn1 |        |       |       |
| Capacity (veh/h)         | 406    | 768   | 1335  | -      | -    | 1284  | -      | -     | 535   |        |       |       |
| HCM Lane V/C Ratio       | 0.187  | 0.028 | 0.015 | -      | -    | 0.006 | -      | -     | 0.118 |        |       |       |
| HCM Control Delay (s)    | 15.9   | 9.8   | 7.7   | 0      | -    | 7.8   | 0      | -     | 12.6  |        |       |       |
| HCM Lane LOS             | C      | A     | A     | A      | -    | A     | A      | -     | B     |        |       |       |
| HCM 95th %tile Q(veh)    | 0.7    | 0.1   | 0     | -      | -    | 0     | -      | -     | 0.4   |        |       |       |

Intersection: 4: Wulfsohn Road & Midland Ave

| Movement              | EB  | EB  | EB | WB  | WB   | NB  | SB  | SB |
|-----------------------|-----|-----|----|-----|------|-----|-----|----|
| Directions Served     | L   | T   | R  | L   | TR   | LTR | LT  | R  |
| Maximum Queue (ft)    | 54  | 22  | 47 | 35  | 39   | 840 | 90  | 89 |
| Average Queue (ft)    | 18  | 1   | 18 | 5   | 2    | 797 | 36  | 36 |
| 95th Queue (ft)       | 44  | 16  | 46 | 24  | 20   | 976 | 72  | 73 |
| Link Distance (ft)    |     | 776 |    |     | 3357 | 825 | 327 |    |
| Upstream Blk Time (%) |     |     |    |     |      | 64  |     |    |
| Queuing Penalty (veh) |     |     |    |     |      | 191 |     |    |
| Storage Bay Dist (ft) | 100 |     | 25 | 150 |      |     |     | 75 |
| Storage Blk Time (%)  | 0   | 0   | 0  |     |      |     | 2   | 2  |
| Queuing Penalty (veh) | 1   | 0   | 2  |     |      |     | 1   | 1  |

Intersection: 13: Colorado Ave & 8th Street

| Movement              | EB  | WB  | NB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR | LTR |
| Maximum Queue (ft)    | 220 | 177 | 97  | 80  |
| Average Queue (ft)    | 146 | 110 | 43  | 38  |
| 95th Queue (ft)       | 228 | 169 | 76  | 69  |
| Link Distance (ft)    | 218 | 226 | 404 | 398 |
| Upstream Blk Time (%) | 4   |     |     |     |
| Queuing Penalty (veh) | 10  |     |     |     |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 15: 9th Street & Colorado Ave

| Movement              | EB  | WB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | LTR | LTR |
| Maximum Queue (ft)    | 61  | 72  | 71  |
| Average Queue (ft)    | 33  | 37  | 34  |
| 95th Queue (ft)       | 52  | 58  | 54  |
| Link Distance (ft)    | 501 | 211 | 404 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 16: 9th Street & SH-82

| Movement              | EB  | EB  | WB  | WB  | NB  | NB  | NB  | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | L   | TR  | L   | TR  | L   | T   | TR  | L   | T   | TR  |
| Maximum Queue (ft)    | 98  | 166 | 100 | 268 | 174 | 482 | 476 | 132 | 336 | 317 |
| Average Queue (ft)    | 57  | 59  | 44  | 125 | 54  | 429 | 405 | 29  | 151 | 138 |
| 95th Queue (ft)       | 102 | 133 | 102 | 238 | 153 | 523 | 543 | 90  | 289 | 274 |
| Link Distance (ft)    |     | 211 |     | 277 |     | 433 | 433 |     | 412 | 412 |
| Upstream Blk Time (%) |     | 0   |     | 2   |     | 30  | 28  |     |     |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     | 0   | 0   |     |     |     |
| Storage Bay Dist (ft) | 75  |     | 75  |     | 150 |     |     | 125 |     |     |
| Storage Blk Time (%)  | 20  | 8   | 4   | 42  | 0   | 38  |     |     | 10  |     |
| Queuing Penalty (veh) | 16  | 4   | 5   | 14  | 0   | 24  |     |     | 3   |     |

Intersection: 20: GMF/PnR & Wulfsohn Road

| Movement              | EB  | WB   | NB  | NB  | SB  |
|-----------------------|-----|------|-----|-----|-----|
| Directions Served     | LTR | LTR  | LT  | R   | LTR |
| Maximum Queue (ft)    | 31  | 1310 | 347 | 251 | 277 |
| Average Queue (ft)    | 1   | 622  | 229 | 66  | 161 |
| 95th Queue (ft)       | 15  | 1493 | 438 | 275 | 329 |
| Link Distance (ft)    | 825 | 1500 | 334 | 334 | 254 |
| Upstream Blk Time (%) |     | 9    | 51  | 15  | 44  |
| Queuing Penalty (veh) |     | 0    | 0   | 0   | 0   |
| Storage Bay Dist (ft) |     |      |     |     |     |
| Storage Blk Time (%)  |     |      |     |     |     |
| Queuing Penalty (veh) |     |      |     |     |     |



## Appendix D - APRIL 2023 TRAFFIC COUNTS

|            |                                   |
|------------|-----------------------------------|
| Study Name | 8th&Colorado                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

Traffic Study

|                           |                                                           |         |
|---------------------------|-----------------------------------------------------------|---------|
| Start Date                | Tuesday, April 25, 2023 11:00 AM                          |         |
| End Date                  | Wednesday, April 26, 2023 6:45 PM                         |         |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |         |
| 04/25/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/25/2023 PM Peaks       | 12:00 PM - 1:00 PM                                        |         |
| 04/25/2023 PM Peaks       | 5:00 PM - 6:00 PM                                         |         |
| 04/26/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/26/2023 PM Peaks       | 12:00 PM - 1:00 PM                                        | 729 DHV |
| 04/26/2023 PM Peaks       | 4:45 PM - 5:45 PM                                         | 557 DHV |



|            |                                   |
|------------|-----------------------------------|
| Study Name | 8th&Colorado                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |                 |    |       |      |  |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|-----------------|----|-------|------|--|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     | s on Credestria |    | Total |      |  |
| Peak 1              | Lights     | 11         | 10   | 24   | 0  | 45   | 60   | 29        | 99   | 25   | 0    | 153  | 182  | 14         | 7    | 18   | 0  | 39   | 77   | 42        | 144  | 24   | 0  | 210  | 128  | 447       | N               | 0  | 11    | 11   |  |
| Specified Period    | %          | 100%       | 91%  | 89%  | 0% | 92%  | 97%  | 97%       | 97%  | 100% | 0%   | 97%  | 96%  | 93%        | 88%  | 78%  | 0% | 85%  | 92%  | 88%       | 97%  | 100% | 0% | 95%  | 94%  | 95%       |                 | 0% | 100%  |      |  |
| 11:00 AM - 12:00 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0    | 4    | 0  | 4    | 4    | 4         | 0    | 0    | 0  | 4    | 5    | 9         | E               | 0  | 13    | 13   |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 17%  | 0% | 9%   | 5%   | 8%        | 0%   | 0%   | 0% | 2%   | 4%   | 2%        |                 | 0% | 100%  |      |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 1    | 3    | 0  | 4    | 2    | 1         | 2    | 0    | 0    | 3    | 8    | 1          | 1    | 1    | 0  | 3    | 3    | 2         | 4    | 0    | 0  | 6    | 3    | 16        | S               | 0  | 10    | 10   |  |
|                     | %          | 0%         | 9%   | 11%  | 0% | 8%   | 3%   | 3%        | 2%   | 0%   | 0%   | 2%   | 4%   | 7%         | 13%  | 4%   | 0% | 7%   | 4%   | 4%        | 3%   | 0%   | 0% | 3%   | 2%   | 3%        |                 | 0% | 100%  |      |  |
|                     | Total      | 11         | 11   | 27   | 0  | 49   | 62   | 30        | 102  | 25   | 0    | 157  | 190  | 15         | 8    | 23   | 0  | 46   | 84   | 48        | 148  | 24   | 0  | 220  | 136  | 472       | W               | 0  | 12    | 12   |  |
|                     | PHF        | 0.55       | 0.69 | 0.75 | 0  | 0.82 | 0.74 | 0.68      | 0.75 | 0.78 | 0    | 0.8  | 0.91 | 0.75       | 0.67 | 0.64 | 0  | 0.72 | 0.88 | 0.71      | 0.95 | 0.67 | 0  | 0.86 | 0.85 | 0.92      |                 | 0% | 100%  |      |  |
|                     | Approach % |            |      |      |    | 10%  | 13%  |           |      |      |      | 33%  | 40%  |            |      |      |    | 10%  | 18%  |           |      |      |    | 47%  | 29%  |           |                 | 0  | 46    | 46   |  |
| Peak 2              | Lights     | 12         | 15   | 36   | 0  | 63   | 71   | 39        | 99   | 22   | 1    | 161  | 225  | 22         | 0    | 34   | 0  | 56   | 108  | 71        | 166  | 32   | 0  | 269  | 145  | 549       | N               | 0  | 29    | 29   |  |
| Specified Period    | %          | 100%       | 100% | 100% | 0% | 100% | 97%  | 95%       | 99%  | 100% | 100% | 98%  | 99%  | 100%       | 0%   | 89%  | 0% | 93%  | 97%  | 96%       | 99%  | 100% | 0% | 98%  | 97%  | 98%       |                 | 0% | 100%  |      |  |
| 12:00 PM - 1:30 PM  | Buses      | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 0    | 0    | 0    | 1    | 1    | 0          | 0    | 4    | 0  | 4    | 3    | 3         | 1    | 0    | 0  | 4    | 4    | 9         | E               | 0  | 39    | 39   |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 2%        | 0%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 11%  | 0% | 7%   | 3%   | 4%        | 1%   | 0%   | 0% | 1%   | 3%   | 2%        |                 | 0% | 100%  |      |  |
| 12:00 PM - 1:00 PM  | Trucks     | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 1    | 0    | 0    | 2    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0  | 1    | 1    | 3         | S               | 0  | 0     | 0    |  |
|                     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 2%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 0%   | 1%   | 1%        | 1%              |    | 0%    | 0%   |  |
|                     | Total      | 12         | 15   | 36   | 0  | 63   | 73   | 41        | 100  | 22   | 1    | 164  | 227  | 22         | 0    | 38   | 0  | 60   | 111  | 74        | 168  | 32   | 0  | 274  | 150  | 561       | W               | 0  | 14    | 14   |  |
|                     | PHF        | 0.38       | 0.54 | 0.69 | 0  | 0.56 | 0.79 | 0.73      | 0.86 | 0.92 | 0.25 | 0.89 | 0.87 | 0.55       | 0    | 0.68 | 0  | 0.83 | 0.77 | 0.8       | 0.88 | 0.73 | 0  | 0.89 | 0.87 | 0.86      |                 | 0% | 100%  |      |  |
|                     | Approach % |            |      |      |    | 11%  | 13%  |           |      |      |      | 29%  | 40%  |            |      |      |    | 11%  | 20%  |           |      |      |    | 49%  | 27%  |           |                 | 0  | 82    | 82   |  |
| Peak 3              | Lights     | 17         | 14   | 39   | 0  | 70   | 85   | 49        | 158  | 22   | 0    | 229  | 195  | 17         | 16   | 36   | 0  | 69   | 79   | 43        | 139  | 20   | 0  | 202  | 211  | 570       | N               | 0  | 26    | 26   |  |
| Specified Period    | %          | 100%       | 100% | 98%  | 0% | 99%  | 100% | 100%      | 100% | 100% | 0%   | 100% | 99%  | 100%       | 100% | 88%  | 0% | 93%  | 94%  | 90%       | 100% | 100% | 0% | 98%  | 98%  | 98%       |                 | 0% | 100%  |      |  |
| 4:00 PM - 6:30 PM   | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 0          | 0    | 5    | 0  | 5    | 5    | 5         | 0    | 0    | 0  | 5    | 5    | 10        | E               | 0  | 17    | 17   |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 0%         | 0%   | 12%  | 0% | 7%   | 6%   | 10%       | 0%   | 0%   | 0% | 2%   | 2%   | 2%        |                 | 0% | 100%  |      |  |
| 5:00 PM - 6:00 PM   | Trucks     | 0          | 0    | 1    | 0  | 1    | 0    | 0         | 0    | 0    | 0    | 0    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0  | 0    | 0    | 1         | S               | 0  | 14    | 14   |  |
|                     | %          | 0%         | 0%   | 3%   | 0% | 1%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%              |    | 0%    | 100% |  |
|                     | Total      | 17         | 14   | 40   | 0  | 71   | 85   | 49        | 158  | 22   | 0    | 229  | 196  | 17         | 16   | 41   | 0  | 74   | 84   | 48        | 139  | 20   | 0  | 207  | 216  | 581       | W               | 0  | 0     | 0    |  |
|                     | PHF        | 0.85       | 0.7  | 0.77 | 0  | 0.93 | 0.73 | 0.82      | 0.86 | 0.69 | 0    | 0.91 | 0.86 | 0.71       | 0.67 | 0.85 | 0  | 0.77 | 0.75 | 0.8       | 0.83 | 0.62 | 0  | 0.92 | 0.89 | 0.95      |                 | 0% | 0%    |      |  |
|                     | Approach % |            |      |      |    | 12%  | 15%  |           |      |      |      | 39%  | 34%  |            |      |      |    | 13%  | 14%  |           |      |      |    | 36%  | 37%  |           |                 | 0  | 57    | 57   |  |
|                     |            |            |      |      |    |      |      |           |      |      |      |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |                 |    |       |      |  |

|            |                                   |
|------------|-----------------------------------|
| Study Name | 8th&Colorado                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |                 |    |       |     |  |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|-----------------|----|-------|-----|--|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     | s on Credestria |    | Total |     |  |
| Peak 1              | Lights     | 14         | 15   | 35   | 0  | 64   | 72   | 42        | 168  | 84   | 2    | 296  | 197  | 13         | 14   | 24   | 0  | 51   | 140  | 41        | 147  | 16   | 0  | 204  | 206  | 615       | N               | 0  | 52    | 52  |  |
| Specified Period    | %          | 100%       | 94%  | 97%  | 0% | 97%  | 99%  | 98%       | 99%  | 100% | 100% | 99%  | 99%  | 100%       | 100% | 83%  | 0% | 91%  | 97%  | 93%       | 99%  | 100% | 0% | 98%  | 97%  | 98%       |                 | 0% | 100%  |     |  |
| 11:00 AM - 12:00 PM | Buses      | 0          | 1    | 0    | 0  | 1    | 1    | 1         | 1    | 0    | 0    | 2    | 0    | 0          | 0    | 5    | 0  | 5    | 4    | 3         | 0    | 0    | 0  | 3    | 6    | 11        | E               | 0  | 32    | 32  |  |
| One Hour Peak       | %          | 0%         | 6%   | 0%   | 0% | 2%   | 1%   | 2%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 17%  | 0% | 9%   | 3%   | 7%        | 0%   | 0%   | 0% | 1%   | 3%   | 2%        |                 | 0% | 100%  |     |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 0    | 1    | 0  | 1    | 0    | 0         | 1    | 0    | 0    | 1    | 3    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 2    | 0    | 0  | 2    | 1    | 4         | S               | 0  | 12    | 12  |  |
|                     | %          | 0%         | 0%   | 3%   | 0% | 2%   | 0%   | 0%        | 1%   | 0%   | 0%   | 0%   | 2%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 0%   | 1%        |                 | 0% | 100%  |     |  |
|                     | Total      | 14         | 16   | 36   | 0  | 66   | 73   | 43        | 170  | 84   | 2    | 299  | 200  | 13         | 14   | 29   | 0  | 56   | 144  | 44        | 149  | 16   | 0  | 209  | 213  | 630       | W               | 0  | 18    | 18  |  |
|                     | PHF        | 0.7        | 0.67 | 0.64 | 0  | 0.72 | 0.68 | 0.9       | 0.9  | 0.68 | 0.5  | 0.82 | 0.86 | 0.81       | 0.58 | 0.66 | 0  | 0.82 | 0.84 | 0.69      | 0.96 | 0.44 | 0  | 0.86 | 0.85 | 0.93      |                 | 0% | 100%  |     |  |
|                     | Approach % |            |      |      |    | 10%  | 12%  |           |      |      |      | 47%  | 32%  |            |      |      |    | 9%   | 23%  |           |      |      |    | 33%  | 34%  |           |                 | 0  | 114   | 114 |  |
| Peak 2              | Lights     | 20         | 23   | 18   | 0  | 61   | 95   | 67        | 164  | 109  | 1    | 341  | 218  | 17         | 16   | 34   | 0  | 67   | 177  | 45        | 182  | 12   | 0  | 239  | 218  | 708       | N               | 0  | 50    | 50  |  |
| Specified Period    | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 100%      | 96%  | 98%  | 100% | 98%  | 99%  | 100%       | 100% | 89%  | 0% | 94%  | 96%  | 88%       | 98%  | 100% | 0% | 96%  | 96%  | 97%       |                 | 0% | 100%  |     |  |
| 12:00 PM - 1:30 PM  | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0    | 4    | 0  | 4    | 5    | 5         | 0    | 0    | 0  | 5    | 5    | 10        | E               | 1  | 39    | 40  |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 0%   | 0%   | 0%         | 0%   | 11%  | 0% | 6%   | 3%   | 10%       | 0%   | 0%   | 0% | 2%   | 2%   | 1%        |                 | 3% | 98%   |     |  |
| 12:00 PM - 1:00 PM  | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 5    | 2    | 0    | 7    | 3    | 0          | 0    | 0    | 0  | 0    | 3    | 1         | 3    | 0    | 0  | 4    | 5    | 11        | S               | 1  | 22    | 23  |  |
| Pedestrians         | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 3%   | 2%   | 0%   | 2%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 2%   | 2%        | 2%   | 0%   | 0% | 2%   | 2%   | 2%        |                 | 4% | 96%   |     |  |
| 151                 | Total      | 20         | 23   | 18   | 0  | 61   | 95   | 67        | 170  | 111  | 1    | 349  | 221  | 17         | 16   | 38   | 0  | 71   | 185  | 51        | 185  | 12   | 0  | 248  | 228  | 729       | W               | 0  | 38    | 38  |  |
|                     | PHF        | 0.71       | 0.64 | 0.56 | 0  | 0.9  | 0.79 | 0.8       | 0.71 | 0.87 | 0.25 | 0.82 | 0.89 | 0.71       | 0.57 | 0.79 | 0  | 0.74 | 0.86 | 0.8       | 0.87 | 0.75 | 0  | 0.9  | 0.76 | 0.88      |                 | 0% | 100%  |     |  |
|                     | Approach % |            |      |      |    | 8%   | 13%  |           |      |      |      | 48%  | 30%  |            |      |      |    | 10%  | 25%  |           |      |      |    | 34%  | 31%  | 2.9%      |                 | 2  | 149   | 151 |  |
| Peak 3              | Lights     | 17         | 15   | 28   | 0  | 60   | 85   | 53        | 125  | 19   | 1    | 198  | 202  | 24         | 7    | 32   | 0  | 63   | 79   | 45        | 149  | 25   | 0  | 219  | 174  | 540       | N               | 0  | 26    | 26  |  |
| Specified Period    | %          | 100%       | 100% | 97%  | 0% | 98%  | 99%  | 100%      | 98%  | 100% | 50%  | 99%  | 98%  | 100%       | 88%  | 89%  | 0% | 93%  | 93%  | 88%       | 99%  | 100% | 0% | 96%  | 97%  | 97%       |                 | 0% | 100%  |     |  |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0    | 4    | 0  | 4    | 3    | 3         | 0    | 0    | 0  | 3    | 5    | 8         | E               | 1  | 13    | 14  |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 0%   | 0%   | 0%         | 0%   | 11%  | 0% | 6%   | 4%   | 6%        | 0%   | 0%   | 0% | 1%   | 3%   | 1%        |                 | 7% | 93%   |     |  |
| 4:45 PM - 5:45 PM   | Trucks     | 0          | 0    | 1    | 0  | 1    | 1    | 0         | 1    | 0    | 1    | 2    | 4    | 0          | 1    | 0    | 0  | 1    | 3    | 3         | 2    | 0    | 0  | 5    | 1    | 9         | S               | 0  | 22    | 22  |  |
| Pedestrians         | %          | 0%         | 0%   | 3%   | 0% | 2%   | 1%   | 0%        | 1%   | 0%   | 50%  | 1%   | 2%   | 0%         | 13%  | 0%   | 0% | 1%   | 4%   | 6%        | 1%   | 0%   | 0% | 2%   | 1%   | 2%        |                 | 0% | 100%  |     |  |
| 74                  | Total      | 17         | 15   | 29   | 0  | 61   | 86   | 53        | 127  | 19   | 2    | 201  | 206  | 24         | 8    | 36   | 0  | 68   | 85   | 51        | 151  | 25   | 0  | 227  | 180  | 557       | W               | 0  | 12    | 12  |  |
|                     | PHF        | 0.85       | 0.75 | 0.72 | 0  | 0.8  | 0.83 | 0.83      | 0.88 | 0.79 | 0.5  | 0.9  | 0.9  | 0.67       | 0.5  | 0.9  | 0  | 0.74 | 0.85 | 0.8       | 0.92 | 0.78 | 0  | 0.93 | 0.92 | 0.95      |                 | 0% | 100%  |     |  |
|                     | Approach % |            |      |      |    | 11%  | 15%  |           |      |      |      | 36%  | 37%  |            |      |      |    | 12%  | 15%  |           |      |      |    | 41%  | 32%  | 3.1%      |                 | 1  | 73    | 74  |  |
|                     |            |            |      |      |    |      |      |           |      |      |      |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |                 |    |       |     |  |

|            |                                   |
|------------|-----------------------------------|
| Study Name | 9th & Colorado                    |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

Traffic Study

|                           |                                                           |         |
|---------------------------|-----------------------------------------------------------|---------|
| Start Date                | Tuesday, April 25, 2023 11:00 AM                          |         |
| End Date                  | Wednesday, April 26, 2023 6:45 PM                         |         |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |         |
| 04/25/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/25/2023 PM Peaks       | 12:30 PM - 1:30 PM                                        |         |
| 04/25/2023 PM Peaks       | 4:15 PM - 5:15 PM                                         |         |
| 04/26/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |         |
| 04/26/2023 PM Peaks       | 12:15 PM - 1:15 PM                                        | 352 DHV |
| 04/26/2023 PM Peaks       | 4:30 PM - 5:30 PM                                         | 273 DHV |



|            |                                   |
|------------|-----------------------------------|
| Study Name | 9th & Colorado                    |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |           |               |       |    |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|------|------|------|-----------|-----------|---------------|-------|----|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     | Direction | on Credestria | Total |    |
| Peak 1              | Lights     | 15         | 25   | 38   | 0  | 78   | 43   | 33        | 28   | 8    | 0  | 69   | 75   | 0          | 0    | 1    | 0  | 1    | 49   | 16        | 37   | 10   | 0    | 63   | 44   | 211       | N         | 0             | 0     | 0  |
| Specified Period    | %          | 100%       | 93%  | 88%  | 0% | 92%  | 90%  | 89%       | 97%  | 100% | 0% | 93%  | 91%  | 0%         | 0%   | 100% | 0% | 100% | 96%  | 100%      | 95%  | 91%  | 0%   | 95%  | 98%  | 93%       |           | 0%            | 0%    |    |
| 11:00 AM - 12:00 PM | Buses      | 0          | 0    | 3    | 0  | 3    | 5    | 4         | 0    | 0    | 0  | 4    | 3    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 1    | 0    | 1    | 0    | 8         | E         | 0             | 6     | 6  |
| One Hour Peak       | %          | 0%         | 0%   | 7%   | 0% | 4%   | 10%  | 11%       | 0%   | 0%   | 0% | 5%   | 4%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 9%   | 0%   | 2%   | 0%   | 4%        |           | 0%            | 100%  |    |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 2    | 2    | 0  | 4    | 0    | 0         | 1    | 0    | 0  | 1    | 4    | 0          | 0    | 0    | 0  | 0    | 2    | 0         | 2    | 0    | 0    | 2    | 1    | 7         | S         | 0             | 4     | 4  |
|                     | %          | 0%         | 7%   | 5%   | 0% | 5%   | 0%   | 0%        | 3%   | 0%   | 0% | 1%   | 5%   | 0%         | 0%   | 0%   | 0% | 0%   | 4%   | 0%        | 5%   | 0%   | 0%   | 3%   | 2%   | 3%        |           | 0%            | 100%  |    |
|                     | Total      | 15         | 27   | 43   | 0  | 85   | 48   | 37        | 29   | 8    | 0  | 74   | 82   | 0          | 0    | 1    | 0  | 1    | 51   | 16        | 39   | 11   | 0    | 66   | 45   | 226       | W         | 0             | 14    | 14 |
|                     | PHF        | 0.54       | 0.68 | 0.9  | 0  | 0.92 | 0.57 | 0.58      | 0.66 | 0.67 | 0  | 0.64 | 0.89 | 0          | 0    | 0.25 | 0  | 0.25 | 0.64 | 0.5       | 0.81 | 0.55 | 0    | 0.75 | 0.8  | 0.8       |           | 0%            | 100%  |    |
|                     | Approach % |            |      |      |    | 38%  | 21%  |           |      |      |    | 33%  | 36%  |            |      |      |    | 0%   | 23%  |           |      |      |      | 29%  | 20%  |           |           | 0             | 24    | 24 |
| Peak 2              | Lights     | 27         | 48   | 38   | 0  | 113  | 64   | 37        | 37   | 5    | 0  | 79   | 93   | 0          | 3    | 0    | 0  | 3    | 68   | 15        | 55   | 24   | 1    | 95   | 65   | 290       | N         | 0             | 20    | 20 |
| Specified Period    | %          | 100%       | 100% | 90%  | 0% | 97%  | 90%  | 84%       | 97%  | 100% | 0% | 91%  | 94%  | 0%         | 100% | 0%   | 0% | 100% | 99%  | 94%       | 96%  | 100% | 100% | 97%  | 98%  | 95%       |           | 0%            | 100%  |    |
| 12:00 PM - 1:45 PM  | Buses      | 0          | 0    | 4    | 0  | 4    | 6    | 6         | 0    | 0    | 0  | 6    | 5    | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 1    | 0    | 0    | 2    | 0    | 12        | E         | 0             | 17    | 17 |
| One Hour Peak       | %          | 0%         | 0%   | 10%  | 0% | 3%   | 8%   | 14%       | 0%   | 0%   | 0% | 7%   | 5%   | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 6%        | 2%   | 0%   | 0%   | 2%   | 0%   | 4%        |           | 0%            | 100%  |    |
| 12:30 PM - 1:30 PM  | Trucks     | 0          | 0    | 0    | 0  | 0    | 1    | 1         | 1    | 0    | 0  | 2    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 1    | 3         | S         | 0             | 8     | 8  |
|                     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 2%        | 3%   | 0%   | 0% | 2%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 2%   | 0%   | 0%   | 1%   | 2%   | 1%        |           | 0%            | 100%  |    |
|                     | Total      | 27         | 48   | 42   | 0  | 117  | 71   | 44        | 38   | 5    | 0  | 87   | 99   | 0          | 3    | 0    | 0  | 3    | 69   | 16        | 57   | 24   | 1    | 98   | 66   | 305       | W         | 0             | 28    | 28 |
|                     | PHF        | 0.61       | 0.8  | 0.66 | 0  | 0.77 | 0.89 | 0.79      | 0.73 | 0.62 | 0  | 0.81 | 0.82 | 0          | 0.25 | 0    | 0  | 0.25 | 0.78 | 0.67      | 0.71 | 0.86 | 0.25 | 0.82 | 0.69 | 0.87      |           | 0%            | 100%  |    |
|                     | Approach % |            |      |      |    | 38%  | 23%  |           |      |      |    | 29%  | 32%  |            |      |      |    | 1%   | 23%  |           |      |      |      | 32%  | 22%  |           |           | 0             | 73    | 73 |
| Peak 3              | Lights     | 12         | 29   | 32   | 0  | 73   | 52   | 40        | 48   | 7    | 0  | 95   | 100  | 0          | 0    | 0    | 0  | 0    | 50   | 14        | 68   | 12   | 0    | 94   | 60   | 262       | N         | 0             | 11    | 11 |
| Specified Period    | %          | 92%        | 100% | 84%  | 0% | 91%  | 91%  | 89%       | 98%  | 100% | 0% | 94%  | 93%  | 0%         | 0%   | 0%   | 0% | 0%   | 100% | 100%      | 99%  | 100% | 0%   | 99%  | 97%  | 95%       |           | 0%            | 100%  |    |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 0    | 6    | 0  | 6    | 4    | 4         | 0    | 0    | 0  | 4    | 6    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 10        | E         | 0             | 6     | 6  |
| One Hour Peak       | %          | 0%         | 0%   | 16%  | 0% | 8%   | 7%   | 9%        | 0%   | 0%   | 0% | 4%   | 6%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 4%        |           | 0%            | 100%  |    |
| 4:15 PM - 5:15 PM   | Trucks     | 1          | 0    | 0    | 0  | 1    | 1    | 1         | 1    | 0    | 0  | 2    | 1    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 2    | 4         | S         | 0             | 1     | 1  |
|                     | %          | 8%         | 0%   | 0%   | 0% | 1%   | 2%   | 2%        | 2%   | 0%   | 0% | 2%   | 1%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 3%   | 1%        |           | 0%            | 100%  |    |
|                     | Total      | 13         | 29   | 38   | 0  | 80   | 57   | 45        | 49   | 7    | 0  | 101  | 107  | 0          | 0    | 0    | 0  | 0    | 50   | 14        | 69   | 12   | 0    | 95   | 62   | 276       | W         | 0             | 26    | 26 |
|                     | PHF        | 0.46       | 0.72 | 0.86 | 0  | 0.74 | 0.84 | 0.7       | 0.77 | 0.58 | 0  | 0.9  | 0.86 | 0          | 0    | 0    | 0  | 0    | 0.78 | 0.7       | 0.82 | 0.75 | 0    | 0.88 | 0.82 | 0.87      |           | 0%            | 100%  |    |
|                     | Approach % |            |      |      |    | 29%  | 21%  |           |      |      |    | 37%  | 39%  |            |      |      |    | 0%   | 18%  |           |      |      |      | 34%  | 22%  |           |           | 0             | 44    | 44 |
|                     |            |            |      |      |    |      |      |           |      |      |    |      |      |            |      |      |    |      |      |           |      |      |      |      |      |           |           |               |       |    |



|            |                                   |
|------------|-----------------------------------|
| Study Name | 9th & Colorado                    |
| Start Date | Tuesday, April 25, 2023 11:00 AM  |
| End Date   | Wednesday, April 26, 2023 6:45 PM |
| Site Code  |                                   |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |    |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |    |                 |       |    |  |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|----|------|----|------|------|-----------|------|------|------|------|------|-----------|----|-----------------|-------|----|--|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T  | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     |    | s on Credestria | Total |    |  |
| Peak 1              | Lights     | 14         | 71   | 51   | 0  | 136  | 57   | 49        | 32   | 7    | 2    | 90   | 80   | 0          | 0  | 0    | 0  | 0    | 91   | 13        | 27   | 8    | 1    | 49   | 47   | 275       | N  | 0               | 10    | 10 |  |
| Specified Period    | %          | 100%       | 100% | 94%  | 0% | 98%  | 92%  | 91%       | 97%  | 100% | 100% | 94%  | 96%  | 0%         | 0% | 0%   | 0% | 0%   | 100% | 100%      | 100% | 100% | 100% | 98%  | 97%  |           | 0% | 100%            |       |    |  |
| 11:00 AM - 12:00 PM | Buses      | 0          | 0    | 3    | 0  | 3    | 5    | 5         | 0    | 0    | 0    | 5    | 3    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 8         | E  | 0               | 12    | 12 |  |
| One Hour Peak       | %          | 0%         | 0%   | 6%   | 0% | 2%   | 8%   | 9%        | 0%   | 0%   | 0%   | 5%   | 4%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 3%   |           | 0% | 100%            |       |    |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 0    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 1    | 1         | S  | 0               | 13    | 13 |  |
|                     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 3%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 2%   | 0%   |           | 0% | 100%            |       |    |  |
|                     | Total      | 14         | 71   | 54   | 0  | 139  | 62   | 54        | 33   | 7    | 2    | 96   | 83   | 0          | 0  | 0    | 0  | 0    | 91   | 13        | 27   | 8    | 1    | 49   | 48   | 284       | W  | 1               | 22    | 23 |  |
|                     | PHF        | 0.7        | 0.66 | 0.79 | 0  | 0.81 | 0.82 | 0.71      | 0.82 | 0.58 | 0.5  | 0.73 | 0.86 | 0          | 0  | 0    | 0  | 0    | 0.65 | 0.65      | 0.75 | 0.5  | 0.25 | 0.82 | 0.86 | 0.79      |    | 4%              | 96%   |    |  |
|                     | Approach % |            |      |      |    | 49%  | 22%  |           |      |      |      | 34%  | 29%  |            |    |      |    | 0%   | 32%  |           |      |      |      | 17%  | 17%  |           |    | 1               | 57    | 58 |  |
| Peak 2              | Lights     | 27         | 114  | 50   | 0  | 191  | 68   | 48        | 27   | 7    | 2    | 84   | 75   | 0          | 0  | 2    | 0  | 2    | 134  | 13        | 23   | 20   | 1    | 57   | 57   | 334       | N  | 1               | 12    | 13 |  |
| Specified Period    | %          | 96%        | 99%  | 89%  | 0% | 96%  | 92%  | 89%       | 96%  | 100% | 100% | 92%  | 89%  | 0%         | 0% | 100% | 0% | 100% | 99%  | 100%      | 88%  | 100% | 100% | 95%  | 97%  | 95%       |    | 8%              | 92%   |    |  |
| 12:00 PM - 1:45 PM  | Buses      | 1          | 0    | 5    | 0  | 6    | 6    | 6         | 0    | 0    | 0    | 6    | 5    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 1    | 12        | E  | 0               | 9     | 9  |  |
| One Hour Peak       | %          | 4%         | 0%   | 9%   | 0% | 3%   | 8%   | 11%       | 0%   | 0%   | 0%   | 7%   | 6%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 2%   | 3%   |           | 0% | 100%            |       |    |  |
| 12:15 PM - 1:15 PM  | Trucks     | 0          | 1    | 1    | 0  | 2    | 0    | 0         | 1    | 0    | 0    | 1    | 4    | 0          | 0  | 0    | 0  | 0    | 1    | 0         | 3    | 0    | 0    | 3    | 1    | 6         | S  | 1               | 8     | 9  |  |
|                     | %          | 0%         | 1%   | 2%   | 0% | 1%   | 0%   | 0%        | 4%   | 0%   | 0%   | 1%   | 5%   | 0%         | 0% | 0%   | 0% | 0%   | 1%   | 0%        | 12%  | 0%   | 0%   | 5%   | 2%   | 2%        |    | 11%             | 89%   |    |  |
|                     | Total      | 28         | 115  | 56   | 0  | 199  | 74   | 54        | 28   | 7    | 2    | 91   | 84   | 0          | 0  | 2    | 0  | 2    | 135  | 13        | 26   | 20   | 1    | 60   | 59   | 352       | W  | 0               | 39    | 39 |  |
|                     | PHF        | 0.78       | 0.74 | 0.82 | 0  | 0.83 | 0.8  | 0.79      | 0.78 | 0.58 | 0.5  | 0.88 | 0.84 | 0          | 0  | 0.5  | 0  | 0.5  | 0.78 | 0.65      | 0.81 | 0.83 | 0.25 | 0.79 | 0.87 | 0.92      |    | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |    | 57%  | 21%  |           |      |      |      | 26%  | 24%  |            |    |      |    | 1%   | 38%  |           |      |      |      | 17%  | 17%  | 5.1%      |    | 2               | 68    | 70 |  |
| Peak 3              | Lights     | 14         | 34   | 43   | 0  | 91   | 44   | 32        | 40   | 16   | 0    | 88   | 99   | 0          | 0  | 0    | 0  | 0    | 64   | 14        | 56   | 12   | 0    | 82   | 54   | 261       | N  | 0               | 5     | 5  |  |
| Specified Period    | %          | 93%        | 100% | 91%  | 0% | 95%  | 90%  | 86%       | 98%  | 100% | 0%   | 94%  | 95%  | 0%         | 0% | 0%   | 0% | 0%   | 100% | 100%      | 98%  | 100% | 0%   | 99%  | 96%  | 96%       |    | 0%              | 100%  |    |  |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 0    | 4    | 0  | 4    | 4    | 4         | 0    | 0    | 0    | 4    | 4    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 8         | E  | 0               | 11    | 11 |  |
| One Hour Peak       | %          | 0%         | 0%   | 9%   | 0% | 4%   | 8%   | 11%       | 0%   | 0%   | 0%   | 4%   | 4%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 3%        |    | 0%              | 100%  |    |  |
| 4:30 PM - 5:30 PM   | Trucks     | 1          | 0    | 0    | 0  | 1    | 1    | 1         | 1    | 0    | 0    | 2    | 1    | 0          | 0  | 0    | 0  | 0    | 0    | 0         | 1    | 0    | 0    | 1    | 2    | 4         | S  | 0               | 6     | 6  |  |
|                     | %          | 7%         | 0%   | 0%   | 0% | 1%   | 2%   | 3%        | 2%   | 0%   | 0%   | 2%   | 1%   | 0%         | 0% | 0%   | 0% | 0%   | 0%   | 0%        | 2%   | 0%   | 0%   | 1%   | 4%   | 1%        |    | 0%              | 100%  |    |  |
|                     | Total      | 15         | 34   | 47   | 0  | 96   | 49   | 37        | 41   | 16   | 0    | 94   | 104  | 0          | 0  | 0    | 0  | 0    | 64   | 14        | 57   | 12   | 0    | 83   | 56   | 273       | W  | 0               | 11    | 11 |  |
|                     | PHF        | 0.62       | 0.85 | 0.62 | 0  | 0.89 | 0.77 | 0.84      | 0.64 | 0.57 | 0    | 0.81 | 0.93 | 0          | 0  | 0    | 0  | 0    | 0.84 | 0.7       | 0.75 | 0.6  | 0    | 0.83 | 0.67 | 0.9       |    | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |    | 35%  | 18%  |           |      |      |      | 34%  | 38%  |            |    |      |    | 0%   | 23%  |           |      |      |      | 30%  | 21%  | 4.4%      |    | 0               | 33    | 33 |  |
|                     |            |            |      |      |    |      |      |           |      |      |      |      |      |            |    |      |    |      |      |           |      |      |      |      |      |           |    |                 |       |    |  |

|            |                                  |
|------------|----------------------------------|
| Study Name | 9th & Grand                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM |
| End Date   | Thursday, April 27, 2023 6:45 PM |
| Site Code  |                                  |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

Traffic Study

|                           |                                                           |          |
|---------------------------|-----------------------------------------------------------|----------|
| Start Date                | Tuesday, April 25, 2023 11:00 AM                          |          |
| End Date                  | Thursday, April 27, 2023 6:45 PM                          |          |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |          |
| 04/25/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |          |
| 04/25/2023 PM Peaks       | 12:30 PM - 1:30 PM                                        |          |
| 04/25/2023 PM Peaks       | 4:45 PM - 5:45 PM                                         |          |
| 04/27/2023 AM Peaks       | 11:00 AM - 12:00 PM                                       |          |
| 04/27/2023 PM Peaks       | 12:45 PM - 1:45 PM                                        | 2014 DHV |
| 04/27/2023 PM Peaks       | 4:45 PM - 5:45 PM                                         | 2719 SHV |



|            |                                  |
|------------|----------------------------------|
| Study Name | 9th & Grand                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM |
| End Date   | Thursday, April 27, 2023 6:45 PM |
| Site Code  |                                  |

Report Summary

|                     |            | Southbound |      |      |      |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |   |                 |       |    |  |
|---------------------|------------|------------|------|------|------|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|---|-----------------|-------|----|--|
| Time Period         | Class.     | R          | T    | L    | U    | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     |   | s on Credestria | Total |    |  |
| Peak 1              | Lights     | 22         | 647  | 10   | 0    | 679  | 651  | 37        | 17   | 15   | 0  | 69   | 19   | 1          | 603  | 24   | 0  | 628  | 721  | 59        | 8    | 11   | 0  | 78   | 63   | 1454      | N | 0               | 6     | 6  |  |
| Specified Period    | %          | 96%        | 94%  | 100% | 0%   | 95%  | 93%  | 97%       | 100% | 94%  | 0% | 97%  | 100% | 100%       | 93%  | 83%  | 0% | 92%  | 94%  | 91%       | 100% | 92%  | 0% | 92%  | 91%  | 94%       |   | 0%              | 100%  |    |  |
| 11:00 AM - 12:00 PM | Buses      | 1          | 4    | 0    | 0    | 5    | 3    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 3    | 4    | 0  | 7    | 7    | 3         | 0    | 0    | 0  | 3    | 5    | 15        | E | 0               | 33    | 33 |  |
| One Hour Peak       | %          | 4%         | 1%   | 0%   | 0%   | 1%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 14%  | 0% | 1%   | 1%   | 5%        | 0%   | 0%   | 0% | 4%   | 7%   | 1%        |   | 0%              | 100%  |    |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 34   | 0    | 0    | 34   | 46   | 1         | 0    | 1    | 0  | 2    | 0    | 0          | 44   | 1    | 0  | 45   | 38   | 3         | 0    | 1    | 0  | 4    | 1    | 85        | S | 0               | 7     | 7  |  |
|                     | %          | 0%         | 5%   | 0%   | 0%   | 5%   | 7%   | 3%        | 0%   | 6%   | 0% | 3%   | 0%   | 0%         | 7%   | 3%   | 0% | 7%   | 5%   | 5%        | 0%   | 8%   | 0% | 5%   | 1%   | 5%        |   | 0%              | 100%  |    |  |
|                     | Total      | 23         | 685  | 10   | 0    | 718  | 700  | 38        | 17   | 16   | 0  | 71   | 19   | 1          | 650  | 29   | 0  | 680  | 766  | 65        | 8    | 12   | 0  | 85   | 69   | 1554      | W | 0               | 8     | 8  |  |
|                     | PHF        | 0.82       | 0.86 | 0.62 | 0    | 0.87 | 0.94 | 0.73      | 0.71 | 0.67 | 0  | 0.85 | 0.59 | 0.25       | 0.96 | 0.56 | 0  | 0.95 | 0.86 | 0.77      | 0.5  | 0.5  | 0  | 0.82 | 0.69 | 0.92      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |      | 46%  | 45%  |           |      |      |    | 5%   | 1%   |            |      |      |    | 44%  | 49%  |           |      |      |    | 5%   | 4%   |           |   | 0               | 54    | 54 |  |
| Peak 2              | Lights     | 22         | 684  | 9    | 0    | 715  | 566  | 64        | 36   | 31   | 0  | 131  | 19   | 0          | 478  | 11   | 0  | 489  | 775  | 60        | 10   | 24   | 0  | 94   | 69   | 1429      | N | 0               | 17    | 17 |  |
| Specified Period    | %          | 92%        | 96%  | 100% | 0%   | 95%  | 93%  | 100%      | 100% | 97%  | 0% | 99%  | 100% | 0%         | 92%  | 65%  | 0% | 91%  | 95%  | 94%       | 100% | 92%  | 0% | 94%  | 90%  | 94%       |   | 0%              | 100%  |    |  |
| 12:00 PM - 1:45 PM  | Buses      | 0          | 3    | 0    | 0    | 3    | 4    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 3    | 6    | 0  | 9    | 7    | 4         | 0    | 1    | 0  | 5    | 6    | 17        | E | 0               | 28    | 28 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0%   | 0%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 35%  | 0% | 2%   | 1%   | 6%        | 0%   | 4%   | 0% | 5%   | 8%   | 1%        |   | 0%              | 100%  |    |  |
| 12:30 PM - 1:30 PM  | Trucks     | 2          | 29   | 0    | 0    | 31   | 39   | 0         | 0    | 1    | 0  | 1    | 0    | 0          | 38   | 0    | 0  | 38   | 30   | 0         | 0    | 1    | 0  | 1    | 2    | 71        | S | 0               | 8     | 8  |  |
|                     | %          | 8%         | 4%   | 0%   | 0%   | 4%   | 6%   | 0%        | 0%   | 3%   | 0% | 1%   | 0%   | 0%         | 7%   | 0%   | 0% | 7%   | 4%   | 0%        | 0%   | 4%   | 0% | 1%   | 3%   | 5%        |   | 0%              | 100%  |    |  |
|                     | Total      | 24         | 716  | 9    | 0    | 749  | 609  | 64        | 36   | 32   | 0  | 132  | 19   | 0          | 519  | 17   | 0  | 536  | 812  | 64        | 10   | 26   | 0  | 100  | 77   | 1517      | W | 0               | 13    | 13 |  |
|                     | PHF        | 0.67       | 0.93 | 0.45 | 0    | 0.92 | 0.94 | 0.8       | 0.75 | 0.8  | 0  | 0.89 | 0.68 | 0          | 0.93 | 0.61 | 0  | 0.91 | 0.93 | 0.7       | 0.62 | 0.81 | 0  | 0.71 | 0.71 | 0.98      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |      | 49%  | 40%  |           |      |      |    | 9%   | 1%   |            |      |      |    | 35%  | 54%  |           |      |      |    | 7%   | 5%   |           |   | 0               | 66    | 66 |  |
| Peak 3              | Lights     | 19         | 624  | 22   | 1    | 666  | 1744 | 90        | 19   | 22   | 0  | 131  | 53   | 20         | 1609 | 38   | 0  | 1667 | 696  | 50        | 11   | 44   | 0  | 105  | 76   | 2569      | N | 1               | 14    | 15 |  |
| Specified Period    | %          | 90%        | 99%  | 100% | 100% | 99%  | 99%  | 100%      | 100% | 100% | 0% | 100% | 100% | 100%       | 99%  | 88%  | 0% | 99%  | 98%  | 91%       | 100% | 98%  | 0% | 95%  | 92%  | 98%       |   | 7%              | 93%   |    |  |
| 4:00 PM - 6:45 PM   | Buses      | 1          | 3    | 0    | 0    | 4    | 0    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 0    | 5    | 0  | 5    | 8    | 5         | 0    | 0    | 0  | 5    | 6    | 14        | E | 0               | 11    | 11 |  |
| One Hour Peak       | %          | 5%         | 0%   | 0%   | 0%   | 1%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 12%  | 0% | 0%   | 1%   | 9%        | 0%   | 0%   | 0% | 5%   | 7%   | 1%        |   | 0%              | 100%  |    |  |
| 4:45 PM - 5:45 PM   | Trucks     | 1          | 5    | 0    | 0    | 6    | 20   | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 19   | 0    | 0  | 19   | 5    | 0         | 0    | 1    | 0  | 1    | 1    | 26        | S | 0               | 10    | 10 |  |
|                     | %          | 5%         | 1%   | 0%   | 0%   | 1%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 0%   | 0% | 1%   | 1%   | 0%        | 0%   | 2%   | 0% | 1%   | 1%   | 1%        |   | 0%              | 100%  |    |  |
|                     | Total      | 21         | 632  | 22   | 1    | 676  | 1764 | 90        | 19   | 22   | 0  | 131  | 53   | 20         | 1628 | 43   | 0  | 1691 | 709  | 55        | 11   | 45   | 0  | 111  | 83   | 2609      | W | 0               | 6     | 6  |  |
|                     | PHF        | 0.66       | 0.93 | 0.69 | 0.25 | 0.92 | 0.93 | 0.73      | 0.68 | 0.61 | 0  | 0.73 | 0.63 | 0.71       | 0.93 | 0.83 | 0  | 0.94 | 0.95 | 0.76      | 0.46 | 0.75 | 0  | 0.87 | 0.86 | 0.93      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |      | 26%  | 68%  |           |      |      |    | 5%   | 2%   |            |      |      |    | 65%  | 27%  |           |      |      |    | 4%   | 3%   |           |   | 1               | 41    | 42 |  |
|                     |            |            |      |      |      |      |      |           |      |      |    |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |   |                 |       |    |  |

|            |                                  |
|------------|----------------------------------|
| Study Name | 9th & Grand                      |
| Start Date | Tuesday, April 25, 2023 11:00 AM |
| End Date   | Thursday, April 27, 2023 6:45 PM |
| Site Code  |                                  |

Report Summary

|                     |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |    |      |      | Crosswalk |   |                 |       |    |  |
|---------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|----|------|------|-----------|---|-----------------|-------|----|--|
| Time Period         | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | Total     |   | s on Credestria | Total |    |  |
| Peak 1              | Lights     | 23         | 701  | 13   | 0  | 737  | 791  | 23        | 11   | 24   | 0  | 58   | 53   | 33         | 754  | 66   | 0  | 853  | 775  | 50        | 7    | 14   | 0  | 71   | 100  | 1719      | N | 0               | 26    | 26 |  |
| Specified Period    | %          | 100%       | 94%  | 100% | 0% | 94%  | 94%  | 92%       | 100% | 100% | 0% | 97%  | 98%  | 97%        | 94%  | 96%  | 0% | 94%  | 94%  | 91%       | 100% | 100% | 0% | 93%  | 97%  | 94%       |   | 0%              | 100%  |    |  |
| 11:00 AM - 12:00 PM | Buses      | 0          | 2    | 0    | 0  | 2    | 3    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 3    | 3    | 0  | 6    | 5    | 3         | 0    | 0    | 0  | 3    | 3    | 11        | E | 0               | 20    | 20 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 4%   | 0% | 1%   | 1%   | 5%        | 0%   | 0%   | 0% | 4%   | 3%   | 1%        |   | 0%              | 100%  |    |  |
| 11:00 AM - 12:00 PM | Trucks     | 0          | 46   | 0    | 0  | 46   | 48   | 2         | 0    | 0    | 0  | 2    | 1    | 1          | 46   | 0    | 0  | 47   | 48   | 2         | 0    | 0    | 0  | 2    | 0    | 97        | S | 0               | 10    | 10 |  |
|                     | %          | 0%         | 6%   | 0%   | 0% | 6%   | 6%   | 8%        | 0%   | 0%   | 0% | 3%   | 2%   | 3%         | 6%   | 0%   | 0% | 5%   | 6%   | 4%        | 0%   | 0%   | 0% | 3%   | 0%   | 5%        |   | 0%              | 100%  |    |  |
|                     | Total      | 23         | 749  | 13   | 0  | 785  | 842  | 25        | 11   | 24   | 0  | 60   | 54   | 34         | 803  | 69   | 0  | 906  | 828  | 55        | 7    | 14   | 0  | 76   | 103  | 1827      | W | 0               | 17    | 17 |  |
|                     | PHF        | 0.64       | 0.97 | 0.65 | 0  | 0.97 | 0.94 | 0.69      | 0.46 | 0.86 | 0  | 0.68 | 0.84 | 0.85       | 0.96 | 0.66 | 0  | 0.92 | 0.97 | 0.81      | 0.58 | 0.7  | 0  | 0.86 | 0.7  | 0.93      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |    | 43%  | 46%  |           |      |      |    | 3%   | 3%   |            |      |      |    | 50%  | 45%  |           |      |      |    | 4%   | 6%   |           |   | 0               | 73    | 73 |  |
| Peak 2              | Lights     | 29         | 766  | 15   | 0  | 810  | 907  | 34        | 8    | 27   | 0  | 69   | 50   | 25         | 842  | 58   | 0  | 925  | 848  | 55        | 10   | 31   | 0  | 96   | 95   | 1900      | N | 1               | 28    | 29 |  |
| Specified Period    | %          | 100%       | 94%  | 94%  | 0% | 95%  | 94%  | 100%      | 100% | 100% | 0% | 100% | 94%  | 93%        | 94%  | 91%  | 0% | 94%  | 94%  | 93%       | 100% | 100% | 0% | 96%  | 94%  | 94%       |   | 3%              | 97%   |    |  |
| 12:00 PM - 1:45 PM  | Buses      | 0          | 2    | 0    | 0  | 2    | 6    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 6    | 6    | 0  | 12   | 6    | 4         | 0    | 0    | 0  | 4    | 6    | 18        | E | 0               | 23    | 23 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 9%   | 0% | 1%   | 1%   | 7%        | 0%   | 0%   | 0% | 4%   | 6%   | 1%        |   | 0%              | 100%  |    |  |
| 12:15 PM - 1:15 PM  | Trucks     | 0          | 44   | 1    | 0  | 45   | 49   | 0         | 0    | 0    | 0  | 0    | 3    | 2          | 49   | 0    | 0  | 51   | 44   | 0         | 0    | 0    | 0  | 0    | 0    | 96        | S | 1               | 5     | 6  |  |
|                     | %          | 0%         | 5%   | 6%   | 0% | 5%   | 5%   | 0%        | 0%   | 0%   | 0% | 0%   | 6%   | 7%         | 5%   | 0%   | 0% | 5%   | 5%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 5%        |   | 17%             | 83%   |    |  |
|                     | Total      | 29         | 812  | 16   | 0  | 857  | 962  | 34        | 8    | 27   | 0  | 69   | 53   | 27         | 897  | 64   | 0  | 988  | 898  | 59        | 10   | 31   | 0  | 100  | 101  | 2014      | W | 0               | 18    | 18 |  |
|                     | PHF        | 0.6        | 0.85 | 0.8  | 0  | 0.85 | 0.95 | 0.85      | 0.67 | 0.61 | 0  | 0.72 | 0.83 | 0.56       | 0.93 | 0.67 | 0  | 0.95 | 0.85 | 0.82      | 0.5  | 0.7  | 0  | 0.86 | 0.87 | 0.93      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |    | 43%  | 48%  |           |      |      |    | 3%   | 3%   |            |      |      |    | 49%  | 45%  |           |      |      |    | 5%   | 5%   | 5.7%      |   | 2               | 74    | 76 |  |
| Peak 3              | Lights     | 20         | 766  | 22   | 0  | 808  | 1701 | 85        | 15   | 28   | 0  | 128  | 47   | 14         | 1573 | 39   | 0  | 1626 | 837  | 43        | 11   | 43   | 0  | 97   | 74   | 2659      | N | 1               | 20    | 21 |  |
| Specified Period    | %          | 91%        | 98%  | 100% | 0% | 98%  | 98%  | 100%      | 100% | 97%  | 0% | 99%  | 100% | 100%       | 98%  | 95%  | 0% | 98%  | 98%  | 91%       | 100% | 98%  | 0% | 95%  | 95%  | 98%       |   | 5%              | 95%   |    |  |
| 4:00 PM - 6:45 PM   | Buses      | 0          | 3    | 0    | 0  | 3    | 13   | 0         | 0    | 1    | 0  | 1    | 0    | 0          | 13   | 2    | 0  | 15   | 7    | 3         | 0    | 0    | 0  | 3    | 2    | 22        | E | 3               | 20    | 23 |  |
| One Hour Peak       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 1%   | 0%        | 0%   | 3%   | 0% | 1%   | 0%   | 0%         | 1%   | 5%   | 0% | 1%   | 1%   | 6%        | 0%   | 0%   | 0% | 3%   | 3%   | 1%        |   | 13%             | 87%   |    |  |
| 4:45 PM - 5:45 PM   | Trucks     | 2          | 12   | 0    | 0  | 14   | 23   | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 22   | 0    | 0  | 22   | 13   | 1         | 0    | 1    | 0  | 2    | 2    | 38        | S | 2               | 20    | 22 |  |
|                     | %          | 9%         | 2%   | 0%   | 0% | 2%   | 1%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 1%   | 0%   | 0% | 1%   | 2%   | 2%        | 0%   | 2%   | 0% | 2%   | 3%   | 1%        |   | 9%              | 91%   |    |  |
|                     | Total      | 22         | 781  | 22   | 0  | 825  | 1737 | 85        | 15   | 29   | 0  | 129  | 47   | 14         | 1608 | 41   | 0  | 1663 | 857  | 47        | 11   | 44   | 0  | 102  | 78   | 2719      | W | 0               | 21    | 21 |  |
|                     | PHF        | 0.69       | 0.92 | 0.69 | 0  | 0.95 | 0.95 | 0.73      | 0.75 | 0.66 | 0  | 0.77 | 0.78 | 0.58       | 0.92 | 0.85 | 0  | 0.92 | 0.93 | 0.84      | 0.69 | 0.73 | 0  | 0.88 | 0.93 | 0.95      |   | 0%              | 100%  |    |  |
|                     | Approach % |            |      |      |    | 30%  | 64%  |           |      |      |    | 5%   | 2%   |            |      |      |    | 61%  | 32%  |           |      |      |    | 4%   | 3%   | 2.2%      |   | 6               | 81    | 87 |  |
|                     |            |            |      |      |    |      |      |           |      |      |    |      |      |            |      |      |    |      |      |           |      |      |    |      |      |           |   |                 |       |    |  |

|            |                                   |
|------------|-----------------------------------|
| Study Name | RFTA Access                       |
| Start Date | Tuesday, April 25, 2023 7:00 AM   |
| End Date   | Wednesday, April 26, 2023 6:30 PM |
| Site Code  |                                   |

## Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

## Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
| Ped Data  | Contains detected pedestrian information for the intersection's crosswalks                   |

## Traffic Study

|                           |                                                           |         |
|---------------------------|-----------------------------------------------------------|---------|
| Start Date                | Tuesday, April 25, 2023 7:00 AM                           |         |
| End Date                  | Wednesday, April 26, 2023 6:30 PM                         |         |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |         |
| 04/25/2023 AM Peaks       | 7:45 AM - 8:45 AM                                         |         |
| 04/26/2023 AM Peaks       | 7:30 AM - 8:30 AM                                         | 157 DHV |
| 04/26/2023 PM Peaks       | 4:00 PM - 5:00 PM                                         | 181 DHV |



Study Name

RFTA Access

Start Date

Tuesday, April 25, 2023 7:00 AM

End Date

Wednesday, April 26, 2023 6:30 PM

Site Code

Report Summary

| Time Period       | Class.     | Southbound |      |      |    |      |      | Westbound |      |     |      |      |      | Northbound |      |      |      |      |     | Eastbound |      |      |    |      |      | Crosswalk |                 |         |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|-----|------|------|------|------------|------|------|------|------|-----|-----------|------|------|----|------|------|-----------|-----------------|---------|
|                   |            | R          | T    | L    | U  | I    | O    | R         | T    | L   | U    | I    | O    | R          | T    | L    | U    | I    | O   | R         | T    | L    | U  | I    | O    | Total     | s on Credestria | Total   |
| Peak 1            | Lights     | 4          | 4    | 1    | 0  | 9    | 13   | 2         | 16   | 1   | 0    | 19   | 61   | 4          | 5    | 8    | 0    | 17   | 16  | 11        | 56   | 6    | 0  | 73   | 28   | 118       | N               | 0 0 0   |
| Specified Period  | %          | 80%        | 80%  | 100% | 0% | 82%  | 93%  | 100%      | 73%  | 50% | 0%   | 70%  | 87%  | 57%        | 100% | 73%  | 0%   | 68%  | 73% | 85%       | 92%  | 86%  | 0% | 90%  | 74%  | 82%       |                 | 0% 0%   |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 5    | 0   | 0    | 5    | 5    | 0          | 0    | 2    | 0    | 2    | 2   | 2         | 5    | 0    | 0  | 7    | 7    | 14        | E               | 0 6 6   |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 23%  | 0%  | 0%   | 19%  | 7%   | 0%         | 0%   | 18%  | 0%   | 8%   | 9%  | 15%       | 8%   | 0%   | 0% | 9%   | 18%  | 10%       |                 | 0% 100% |
| 7:45 AM - 8:45 AM | Trucks     | 1          | 1    | 0    | 0  | 2    | 1    | 0         | 1    | 1   | 1    | 3    | 4    | 3          | 0    | 1    | 2    | 6    | 4   | 0         | 0    | 1    | 0  | 1    | 3    | 12        | S               | 0 0 0   |
|                   | %          | 20%        | 20%  | 0%   | 0% | 18%  | 7%   | 0%        | 5%   | 50% | 100% | 11%  | 6%   | 43%        | 0%   | 9%   | 100% | 24%  | 18% | 0%        | 0%   | 14%  | 0% | 1%   | 8%   | 8%        |                 | 0% 0%   |
|                   | Total      | 5          | 5    | 1    | 0  | 11   | 14   | 2         | 22   | 2   | 1    | 27   | 70   | 7          | 5    | 11   | 2    | 25   | 22  | 13        | 61   | 7    | 0  | 81   | 38   | 144       | W               | 0 1 1   |
|                   | PHF        | 0.62       | 0.62 | 0.25 | 0  | 0.92 | 0.58 | 0.5       | 0.69 | 0.5 | 0.25 | 0.75 | 0.76 | 0.58       | 0.62 | 0.69 | 0.25 | 0.62 | 0.5 | 0.46      | 0.69 | 0.44 | 0  | 0.75 | 0.86 | 0.9       |                 | 0% 100% |
|                   | Approach % |            |      |      |    | 8%   | 10%  |           |      |     |      | 19%  | 49%  |            |      |      |      | 17%  | 15% |           |      |      |    | 56%  | 26%  |           |                 | 0 7 7   |



|            |                                   |
|------------|-----------------------------------|
| Study Name | RFTA Access                       |
| Start Date | Tuesday, April 25, 2023 7:00 AM   |
| End Date   | Wednesday, April 26, 2023 6:30 PM |
| Site Code  |                                   |

Report Summary

|                   |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |   |                 |       |    |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|------|------|------|-----------|---|-----------------|-------|----|
| Time Period       | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     |   | s on Credestria | Total |    |
| Peak 1            | Lights     | 2          | 2    | 4    | 0  | 8    | 10   | 3         | 18   | 1    | 0  | 22   | 76   | 1          | 0    | 11   | 0  | 12   | 18   | 15        | 71   | 7    | 0    | 93   | 31   | 135       | N | 0               | 0     | 0  |
| Specified Period  | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 100%      | 72%  | 25%  | 0% | 69%  | 93%  | 33%        | 0%   | 69%  | 0% | 63%  | 82%  | 94%       | 95%  | 100% | 0%   | 95%  | 72%  | 86%       |   | 0%              | 0%    |    |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 7    | 1    | 0  | 8    | 6    | 2          | 0    | 4    | 0  | 6    | 2    | 1         | 4    | 0    | 0    | 5    | 11   | 19        | E | 0               | 6     | 6  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 28%  | 25%  | 0% | 25%  | 7%   | 67%        | 0%   | 25%  | 0% | 32%  | 9%   | 6%        | 5%   | 0%   | 0%   | 5%   | 26%  | 12.1%     |   | 0%              | 100%  |    |
| 7:30 AM - 8:30 AM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 2    | 0  | 2    | 0    | 0          | 0    | 1    | 0  | 1    | 2    | 0         | 0    | 0    | 0    | 0    | 1    | 3         | S | 0               | 0     | 0  |
| Pedestrians       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 50%  | 0% | 6%   | 0%   | 0%         | 0%   | 6%   | 0% | 5%   | 9%   | 0%        | 0%   | 0%   | 0%   | 0%   | 2%   | 1.9%      |   | 0%              | 0%    |    |
| 13                | Total      | 2          | 2    | 4    | 0  | 8    | 10   | 3         | 25   | 4    | 0  | 32   | 82   | 3          | 0    | 16   | 0  | 19   | 22   | 16        | 75   | 7    | 0    | 98   | 43   | 157       | W | 0               | 0     | 0  |
|                   | PHF        | 0.5        | 0.25 | 0.33 | 0  | 0.5  | 0.62 | 0.75      | 0.69 | 0.5  | 0  | 0.8  | 0.85 | 0.38       | 0    | 0.8  | 0  | 0.68 | 0.69 | 0.5       | 0.78 | 0.58 | 0    | 0.84 | 0.72 | 0.91      |   | 0%              | 0%    |    |
|                   | Approach % |            |      |      |    | 5%   | 6%   |           |      |      |    | 20%  | 52%  |            |      |      |    | 12%  | 14%  |           |      |      |      | 62%  | 27%  | 14.0%     |   | 0               | 6     | 6  |
| Peak 2            | Lights     | 12         | 2    | 12   | 0  | 26   | 6    | 0         | 45   | 1    | 0  | 46   | 81   | 4          | 3    | 15   | 0  | 22   | 7    | 4         | 65   | 3    | 1    | 73   | 73   | 167       | N | 0               | 3     | 3  |
| Specified Period  | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 0%        | 88%  | 100% | 0% | 88%  | 95%  | 100%       | 100% | 88%  | 0% | 92%  | 78%  | 67%       | 94%  | 100% | 100% | 92%  | 90%  | 92%       |   | 0%              | 100%  |    |
| 4:00 PM - 6:30 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 6    | 0    | 0  | 6    | 4    | 0          | 0    | 2    | 0  | 2    | 2    | 2         | 4    | 0    | 0    | 6    | 8    | 14        | E | 0               | 2     | 2  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 12%  | 0%   | 0% | 12%  | 5%   | 0%         | 0%   | 12%  | 0% | 8%   | 22%  | 33%       | 6%   | 0%   | 0%   | 8%   | 10%  | 7.7%      |   | 0%              | 100%  |    |
| 4:00 PM - 5:00 PM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0  | 0    | 0    | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0    | 0    | 0    | 0         | S | 0               | 0     | 0  |
| Pedestrians       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 0%   | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0%   | 0%   | 0%   | 0.0%      |   | 0%              | 0%    |    |
| 14                | Total      | 12         | 2    | 12   | 0  | 26   | 6    | 0         | 51   | 1    | 0  | 52   | 85   | 4          | 3    | 17   | 0  | 24   | 9    | 6         | 69   | 3    | 1    | 79   | 81   | 181       | W | 0               | 9     | 9  |
|                   | PHF        | 0.5        | 0.5  | 0.3  | 0  | 0.38 | 0.75 | 0         | 0.85 | 0.25 | 0  | 0.87 | 0.76 | 0.5        | 0.75 | 0.85 | 0  | 0.86 | 0.75 | 0.75      | 0.78 | 0.75 | 0.25 | 0.86 | 0.84 | 0.85      |   | 0%              | 100%  |    |
|                   | Approach % |            |      |      |    | 14%  | 3%   |           |      |      |    | 29%  | 47%  |            |      |      |    | 13%  | 5%   |           |      |      |      | 44%  | 45%  | 7.7%      |   | 0               | 14    | 14 |

|            |                                   |
|------------|-----------------------------------|
| Study Name | W Wulfsohn & Midland Ave          |
| Start Date | Tuesday, April 25, 2023 7:00 AM   |
| End Date   | Wednesday, April 26, 2023 6:30 PM |
| Site Code  |                                   |

Overview

This report contains turning movement volume (TMV) data of vehicular traffic in the intersection of study.

Content

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Summary   | Contains a TMV summary of all vehicular traffic in the intersection for defined peak periods |
| TMV Table | Contains a pivot table of the TMV road and crosswalk data                                    |
| TMV Data  | Contains measured TMV data of all vehicular traffic in the intersection for each approach    |
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Traffic Study

|                           |                                                           |      |     |
|---------------------------|-----------------------------------------------------------|------|-----|
| Start Date                | Tuesday, April 25, 2023 7:00 AM                           |      |     |
| End Date                  | Wednesday, April 26, 2023 6:30 PM                         |      |     |
| Classification Categories | Lights, Buses, Trucks, Bicycles on Crosswalk, Pedestrians |      |     |
| 04/25/2023 AM Peaks       | 7:00 AM - 8:00 AM                                         |      |     |
| 04/25/2023 PM Peaks       | 4:00 PM - 5:00 PM                                         |      |     |
| 04/26/2023 AM Peaks       | 7:00 AM - 8:00 AM                                         | 969  | DHV |
| 04/26/2023 PM Peaks       | 4:00 PM - 5:00 PM                                         | 1309 | DHV |



Report Summary

|                   |            | Southbound |      |      |    |      |      | Westbound |      |      |      |      |      | Northbound |      |      |      |      |      | Eastbound |      |      |      |      |      | Crosswalk |    |            |       |   |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|------|------|------|------|------------|------|------|------|------|------|-----------|------|------|------|------|------|-----------|----|------------|-------|---|
| Time Period       | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | R          | T    | L    | U    | I    | O    | R         | T    | L    | U    | I    | O    | Total     | on | Credestria | Total |   |
| Peak 1            | Lights     | 5          | 1    | 12   | 0  | 18   | 39   | 13        | 233  | 5    | 0    | 251  | 584  | 10         | 1    | 22   | 0    | 33   | 58   | 52        | 562  | 25   | 1    | 640  | 261  | 942       | N  | 0          | 0     | 0 |
| Specified Period  | %          | 83%        | 100% | 92%  | 0% | 90%  | 95%  | 93%       | 98%  | 100% | 0%   | 98%  | 97%  | 100%       | 100% | 81%  | 0%   | 85%  | 95%  | 96%       | 97%  | 96%  | 100% | 97%  | 96%  | 97%       |    | 0%         | 0%    |   |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 3    | 0    | 0    | 3    | 8    | 0          | 0    | 4    | 1    | 5    | 3    | 2         | 8    | 0    | 0    | 10   | 7    | 18        | E  | 0          | 0     | 0 |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 1%   | 0%         | 0%   | 15%  | 100% | 13%  | 5%   | 4%        | 1%   | 0%   | 0%   | 2%   | 3%   | 2%        |    | 0%         | 0%    |   |
| 7:00 AM - 8:00 AM | Trucks     | 1          | 0    | 1    | 0  | 2    | 2    | 1         | 2    | 0    | 0    | 3    | 8    | 0          | 0    | 1    | 0    | 1    | 0    | 0         | 7    | 1    | 0    | 8    | 4    | 14        | S  | 0          | 0     | 0 |
|                   | %          | 17%        | 0%   | 8%   | 0% | 10%  | 5%   | 7%        | 1%   | 0%   | 0%   | 1%   | 1%   | 0%         | 0%   | 4%   | 0%   | 3%   | 0%   | 0%        | 1%   | 4%   | 0%   | 1%   | 1%   | 1%        |    | 0%         | 0%    |   |
|                   | Total      | 6          | 1    | 13   | 0  | 20   | 41   | 14        | 238  | 5    | 0    | 257  | 600  | 10         | 1    | 27   | 1    | 39   | 61   | 54        | 577  | 26   | 1    | 658  | 272  | 974       | W  | 0          | 0     | 0 |
|                   | PHF        | 0.5        | 0.25 | 0.81 | 0  | 0.71 | 0.68 | 0.7       | 0.75 | 0.62 | 0    | 0.77 | 0.72 | 0.62       | 0.25 | 0.75 | 0.25 | 0.89 | 0.76 | 0.75      | 0.72 | 0.65 | 0.25 | 0.73 | 0.8  | 0.76      |    | 0%         | 0%    |   |
|                   | Approach % |            |      |      |    | 2%   | 4%   |           |      |      |      | 26%  | 62%  |            |      |      |      | 4%   | 6%   |           |      |      |      | 68%  | 28%  |           |    | 0          | 0     | 0 |
| Peak 2            | Lights     | 22         | 1    | 10   | 0  | 33   | 23   | 12        | 725  | 1    | 1    | 739  | 323  | 1          | 2    | 64   | 6    | 73   | 64   | 56        | 311  | 9    | 0    | 376  | 811  | 1221      | N  | 0          | 0     | 0 |
| Specified Period  | %          | 96%        | 100% | 100% | 0% | 97%  | 96%  | 100%      | 99%  | 100% | 100% | 99%  | 99%  | 100%       | 67%  | 93%  | 100% | 92%  | 96%  | 95%       | 99%  | 100% | 0%   | 98%  | 98%  | 98%       |    | 0%         | 0%    |   |
| 4:00 PM - 6:45 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 1    | 0         | 1    | 0    | 0    | 1    | 3    | 0          | 1    | 5    | 0    | 6    | 2    | 2         | 3    | 0    | 0    | 5    | 6    | 12        | E  | 0          | 0     | 0 |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 4%   | 0%        | 0%   | 0%   | 0%   | 0%   | 1%   | 0%         | 33%  | 7%   | 0%   | 8%   | 3%   | 3%        | 1%   | 0%   | 0%   | 1%   | 1%   | 1%        |    | 0%         | 0%    |   |
| 4:00 PM - 5:00 PM | Trucks     | 1          | 0    | 0    | 0  | 1    | 0    | 0         | 6    | 0    | 0    | 6    | 0    | 0          | 0    | 0    | 0    | 0    | 1    | 1         | 0    | 0    | 0    | 1    | 7    | 8         | S  | 1          | 1     | 2 |
|                   | %          | 4%         | 0%   | 0%   | 0% | 3%   | 0%   | 0%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%         | 0%   | 0%   | 0%   | 0%   | 1%   | 2%        | 0%   | 0%   | 0%   | 0%   | 1%   | 1%        |    | 50%        | 50%   |   |
|                   | Total      | 23         | 1    | 10   | 0  | 34   | 24   | 12        | 732  | 1    | 1    | 746  | 326  | 1          | 3    | 69   | 6    | 79   | 67   | 59        | 314  | 9    | 0    | 382  | 824  | 1241      | W  | 1          | 0     | 1 |
|                   | PHF        | 0.57       | 0.25 | 0.62 | 0  | 0.61 | 0.46 | 0.38      | 0.83 | 0.25 | 0.25 | 0.83 | 0.88 | 0.25       | 0.75 | 0.78 | 0.38 | 0.82 | 0.84 | 0.78      | 0.86 | 0.56 | 0    | 0.85 | 0.85 | 0.89      |    | 100%       | 0%    |   |
|                   | Approach % |            |      |      |    | 3%   | 2%   |           |      |      |      | 60%  | 26%  |            |      |      |      | 6%   | 5%   |           |      |      |      | 31%  | 66%  |           |    | 2          | 1     | 3 |

|            |                                   |
|------------|-----------------------------------|
| Study Name | W Wulfsohn & Midland Ave          |
| Start Date | Tuesday, April 25, 2023 7:00 AM   |
| End Date   | Wednesday, April 26, 2023 6:30 PM |
| Site Code  |                                   |

Report Summary

|                   |            | Southbound |      |      |    |      |      | Westbound |      |      |    |      |      | Northbound |      |      |    |      |      | Eastbound |      |      |      |      |      | Crosswalk |                 |     |       |   |  |
|-------------------|------------|------------|------|------|----|------|------|-----------|------|------|----|------|------|------------|------|------|----|------|------|-----------|------|------|------|------|------|-----------|-----------------|-----|-------|---|--|
| Time Period       | Class.     | R          | T    | L    | U  | I    | O    | R         | T    | L    | U  | I    | O    | R          | T    | L    | U  | I    | O    | R         | T    | L    | U    | I    | O    | Total     | s on Credestria |     | Total |   |  |
| Peak 1            | Lights     | 4          | 3    | 2    | 0  | 9    | 34   | 13        | 233  | 1    | 0  | 247  | 584  | 3          | 0    | 22   | 0  | 25   | 61   | 57        | 579  | 21   | 0    | 657  | 259  | 938       | N               | 0   | 0     | 0 |  |
| Specified Period  | %          | 100%       | 100% | 40%  | 0% | 75%  | 100% | 100%      | 98%  | 100% | 0% | 98%  | 97%  | 100%       | 0%   | 76%  | 0% | 78%  | 97%  | 97%       | 98%  | 100% | 0%   | 98%  | 96%  | 97%       |                 | 0%  | 0%    |   |  |
| 7:00 AM - 9:15 AM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 3    | 0    | 0  | 3    | 5    | 0          | 0    | 6    | 0  | 6    | 1    | 1         | 5    | 0    | 0    | 6    | 9    | 15        | E               | 0   | 0     | 0 |  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 1%   | 0%         | 0%   | 21%  | 0% | 19%  | 2%   | 2%        | 1%   | 0%   | 0%   | 1%   | 3%   | 2%        |                 | 0%  | 0%    |   |  |
| 7:00 AM - 8:00 AM | Trucks     | 0          | 0    | 3    | 0  | 3    | 0    | 0         | 2    | 0    | 0  | 2    | 12   | 0          | 0    | 1    | 0  | 1    | 1    | 1         | 9    | 0    | 0    | 10   | 3    | 16        | S               | 0   | 0     | 0 |  |
| Pedestrians       | %          | 0%         | 0%   | 60%  | 0% | 25%  | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 2%   | 0%         | 0%   | 3%   | 0% | 3%   | 2%   | 2%        | 2%   | 0%   | 0%   | 1%   | 1%   | 1.7%      |                 | 0%  | 0%    |   |  |
| 0                 | Total      | 4          | 3    | 5    | 0  | 12   | 34   | 13        | 238  | 1    | 0  | 252  | 601  | 3          | 0    | 29   | 0  | 32   | 63   | 59        | 593  | 21   | 0    | 673  | 271  | 969       | W               | 0   | 0     | 0 |  |
|                   | PHF        | 1          | 0.38 | 0.42 | 0  | 0.6  | 0.57 | 0.41      | 0.78 | 0.25 | 0  | 0.8  | 0.73 | 0.38       | 0    | 0.66 | 0  | 0.67 | 0.79 | 0.87      | 0.74 | 0.75 | 0    | 0.76 | 0.79 | 0.77      |                 | 0%  | 0%    |   |  |
|                   | Approach % |            |      |      |    | 1%   | 4%   |           |      |      |    | 26%  | 62%  |            |      |      |    | 3%   | 7%   |           |      |      |      | 69%  | 28%  |           |                 | 0   | 0     | 0 |  |
| Peak 2            | Lights     | 28         | 2    | 14   | 0  | 44   | 15   | 10        | 733  | 6    | 0  | 749  | 369  | 1          | 1    | 64   | 0  | 66   | 81   | 73        | 354  | 4    | 1    | 432  | 826  | 1291      | N               | 0   | 0     | 0 |  |
| Specified Period  | %          | 100%       | 100% | 100% | 0% | 100% | 100% | 100%      | 99%  | 100% | 0% | 99%  | 99%  | 100%       | 100% | 96%  | 0% | 96%  | 96%  | 96%       | 99%  | 100% | 100% | 98%  | 99%  | 99%       |                 | 0%  | 0%    |   |  |
| 4:00 PM - 6:30 PM | Buses      | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 0    | 0    | 0  | 0    | 3    | 0          | 0    | 2    | 0  | 2    | 1    | 1         | 3    | 0    | 0    | 4    | 2    | 6         | E               | 0   | 0     | 0 |  |
| One Hour Peak     | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 0%   | 0%   | 0% | 0%   | 1%   | 0%         | 0%   | 3%   | 0% | 3%   | 1%   | 1%        | 1%   | 0%   | 0%   | 1%   | 0%   | 0%        |                 | 0%  | 0%    |   |  |
| 4:00 PM - 5:00 PM | Trucks     | 0          | 0    | 0    | 0  | 0    | 0    | 0         | 7    | 0    | 0  | 7    | 2    | 0          | 0    | 1    | 0  | 1    | 2    | 2         | 2    | 0    | 0    | 4    | 8    | 12        | S               | 4   | 1     | 5 |  |
| Pedestrians       | %          | 0%         | 0%   | 0%   | 0% | 0%   | 0%   | 0%        | 1%   | 0%   | 0% | 1%   | 1%   | 0%         | 0%   | 1%   | 0% | 1%   | 2%   | 3%        | 1%   | 0%   | 0%   | 1%   | 1%   | 0.9%      |                 | 80% | 20%   |   |  |
| 7                 | Total      | 28         | 2    | 14   | 0  | 44   | 15   | 10        | 740  | 6    | 0  | 756  | 374  | 1          | 1    | 67   | 0  | 69   | 84   | 76        | 359  | 4    | 1    | 440  | 836  | 1309      | W               | 1   | 1     | 2 |  |
|                   | PHF        | 0.7        | 0.5  | 0.58 | 0  | 0.73 | 0.75 | 0.5       | 0.88 | 0.5  | 0  | 0.88 | 0.91 | 0.25       | 0.25 | 0.88 | 0  | 0.91 | 0.91 | 0.9       | 0.93 | 0.5  | 0.25 | 0.96 | 0.9  | 0.92      |                 | 50% | 50%   |   |  |
|                   | Approach % |            |      |      |    | 3%   | 1%   |           |      |      |    | 58%  | 29%  |            |      |      |    | 5%   | 6%   |           |      |      |      | 34%  | 64%  |           |                 | 5   | 2     | 7 |  |

## Appendix E - COMBINED SCENARIO RESULTS – MOES BY MOVEMENT

| RFTA GMF TIS<br>Operational Result Summary |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |
|--------------------------------------------|----------------------|----|-----------------------------------------|---------------|---------|-----|-------|---------------------|-----------------|---------|-----|-------|---------------------|------------------------|---------|-----|-------|---------------------|-----------------------------|---------|-----|-------|---------------------|
| Intersection                               | Approach<br>Movement |    | Link/Storage<br>Bay Distance<br>(L_T_R) | 2023 Baseline |         |     |       |                     | 2043 Background |         |     |       |                     | 2043 Background + RFTA |         |     |       |                     | 2043 Background + GM + RFTA |         |     |       |                     |
|                                            |                      |    |                                         | Overall       | Overall |     |       | 95th % Q<br>(L_T_R) | Overall         | Overall |     |       | 95th % Q<br>(L_T_R) | Overall                | Overall |     |       | 95th % Q<br>(L_T_R) | Overall                     | Overall |     |       | 95th % Q<br>(L_T_R) |
|                                            |                      |    |                                         | LOS           | Delay   | LOS | Delay |                     | LOS             | Delay   | LOS | Delay |                     | LOS                    | Delay   | LOS | Delay |                     | LOS                         | Delay   | LOS | Delay |                     |
| #20 Wulfsohn Rd. and<br>RFTA / PnR         | EB L                 | AM | 825                                     | A             | 2.2     | A   | 7.5   | 8                   | A               | 2.2     | A   | 7.5   | 7                   | A                      | 3.6     | A   | 7.6   | 19                  | A                           | 2.7     | A   | 8     | 16                  |
|                                            |                      | PM |                                         | A             | 2.7     | A   | 7.3   | 7                   | A               | 2.7     | A   | 7.3   | 4                   | A                      | 4.9     | A   | 7.4   | 14                  | A                           | 3.4     | A   | 7.7   | 15                  |
|                                            | WB L                 | AM | 1500**                                  |               |         | A   | 7.3   | 7                   |                 |         | A   | 7.3   | 6                   |                        |         | A   | 7.5   | 15                  |                             |         | A   | 7.7   | 2015                |
|                                            |                      | PM |                                         |               |         | A   | 7.4   | 6                   |                 |         | A   | 7.3   | 2                   |                        |         | A   | 7.4   | 7                   |                             |         | A   | 7.8   | 1493                |
|                                            | NB R                 | AM |                                         |               |         | A   | 8.5   | 20                  |                 |         | A   | 8.5   | 23                  |                        |         | A   | 8.7   | 35                  |                             |         | A   | 9.2   | 134                 |
|                                            |                      | PM | 334**                                   |               |         | A   | 8.7   | 23                  |                 |         | A   | 8.7   | 22                  |                        |         | A   | 8.8   | 42                  |                             |         | A   | 9.8   | 275                 |
|                                            | NB T/L               | AM |                                         |               |         | B   | 10.1  | 42                  |                 |         | B   | 10.1  | 41                  |                        |         | B   | 12    | 50                  |                             |         | C   | 15.9  | 329                 |
|                                            |                      | PM | 334**                                   |               |         | A   | 9.8   | 41                  |                 |         | A   | 9.8   | 40                  |                        |         | B   | 11.1  | 55                  |                             |         | C   | 15.9  | 438                 |
|                                            | SB                   | AM |                                         |               |         | A   | 9.9   | 33                  |                 |         | A   | 9.9   | 35                  |                        |         | B   | 10.8  | 45                  |                             |         | B   | 13.3  | 230                 |
|                                            |                      | PM | 254**                                   |               |         | A   | 9.3   | 35                  |                 |         | A   | 9.3   | 43                  |                        |         | B   | 10    | 56                  |                             |         | B   | 12.6  | 329                 |
|                                            |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |
| #4 - Midland Avenue<br>and Wulfsohn Road   | EB L                 | AM | 95_776_25                               | A             | 1.4     | A   | 8.3   | 29_0_27             | A               | 1.4     | A   | 8.4   | 31_0_28             | A                      | 2.6     | A   | 8.4   | 32_16_38            | E                           | 47.1    | A   | 8.5   | 35_17_47            |
|                                            |                      | PM |                                         | A             | 2.4     | A   | 9.8   | 31_0_28             | A               | 2.6     | B   | 10.3  | 14_8_31             | A                      | 8.6     | B   | 10.3  | 17_10_35            | F                           | 97.8    | B   | 10.9  | 44_16_46            |
|                                            | WB L                 | AM | 95_1350                                 |               |         | B   | 10.6  | 6_2                 |                 |         | B   | 11.1  | 6_2                 |                        |         | B   | 11.4  | 24_9                |                             |         | B   | 11.9  | 27_6                |
|                                            |                      | PM |                                         |               |         | A   | 8.5   | 6_2                 |                 |         | A   | 8.6   | 20_17               |                        |         | A   | 8.7   | 20_24               |                             |         | A   | 9.1   | 24_20               |
|                                            | NB                   | AM |                                         |               |         | D   | 27.9  | 57                  |                 |         | D   | 32.8  | 66                  |                        |         | E   | 43.5  | 134                 |                             |         | F   | 367.2 | 953                 |
|                                            |                      | PM | 825                                     |               |         | D   | 32.1  | 66                  |                 |         | E   | 39.4  | 82                  |                        |         | F   | 88    | 239                 |                             |         | F   | 718.9 | 976                 |
|                                            | SB T/L               | AM |                                         |               |         | C   | 24.6  | 35                  |                 |         | D   | 27.6  | 32                  |                        |         | D   | 29.2  | 32                  |                             |         | D   | 34.3  | 41                  |
|                                            |                      | PM | 327                                     |               |         | C   | 21.8  | 32                  |                 |         | C   | 24.3  | 40                  |                        |         | C   | 24.8  | 41                  |                             |         | E   | 35.9  | 72                  |
|                                            | SB R                 | AM |                                         |               |         | B   | 10.6  | 27                  |                 |         | B   | 10.9  | 26                  |                        |         | B   | 11    | 24                  |                             |         | B   | 11.3  | 34                  |
|                                            |                      | PM | 75                                      |               |         | C   | 16.9  | 26                  |                 |         | C   | 18.7  | 53                  |                        |         | C   | 18.7  | 56                  |                             |         | C   | 21.9  | 73                  |
|                                            |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |
| #13 8th St. and<br>Colorado Ave.           | EB                   | AM | 218                                     | B             | 11      | B   | 10.3  | 87                  | B               | 12.1    | B   | 11.1  | 97                  | C                      | 15.9    | B   | 13.5  | 191                 | D                           | 31.7    | D   | 37.2  | 240                 |
|                                            |                      | PM |                                         | B             | 10.2    | B   | 10.7  | 97                  | B               | 10.8    | B   | 11.5  | 166                 | B                      | 12.1    | B   | 13.4  | 186                 | D                           | 27.7    | D   | 31.7  | 228                 |
|                                            | WB                   | AM |                                         |               |         | B   | 12.1  | 137                 |                 |         | B   | 13.7  | 146                 |                        |         | C   | 19.6  | 157                 |                             |         | E   | 37.2  | 188                 |
|                                            |                      | PM | 226                                     |               |         | B   | 10.2  | 146                 |                 |         | B   | 10.9  | 105                 |                        |         | B   | 11.8  | 106                 |                             |         | D   | 29.7  | 169                 |
|                                            | NB                   | AM |                                         |               |         | B   | 10.3  | 50                  |                 |         | A   | 9.8   | 53                  |                        |         | B   | 10.8  | 61                  |                             |         | B   | 12.2  | 64                  |
|                                            |                      | PM | 404                                     |               |         | A   | 9.2   | 53                  |                 |         | A   | 9.5   | 72                  |                        |         | B   | 10.2  | 79                  |                             |         | B   | 12.3  | 76                  |
|                                            | SB                   | AM |                                         |               |         | A   | 9.1   | 49                  |                 |         | A   | 9.5   | 55                  |                        |         | B   | 10.3  | 63                  |                             |         | B   | 11.6  | 63                  |
|                                            |                      | PM | 398                                     |               |         | A   | 9.2   | 55                  |                 |         | A   | 9.5   | 60                  |                        |         | A   | 9.9   | 71                  |                             |         | B   | 11.8  | 69                  |
|                                            |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |
| #15 9th St. and<br>Colorado Ave.           | EB                   | AM | 501                                     | A             | 8.8     | A   | 8.1   | 51                  | A               | 9.1     | A   | 8.3   | 54                  | A                      | 9.6     | A   | 8.5   | 57                  | A                           | 9.6     | A   | 8.5   | 52                  |
|                                            |                      | PM |                                         | A             | 8       | A   | 7.9   | 54                  | A               | 8.1     | A   | 8     | 53                  | A                      | 8.2     | A   | 8.1   | 56                  | A                           | 8.2     | A   | 8.1   | 52                  |
|                                            | WB                   | AM |                                         |               |         | A   | 8     | 62                  |                 |         | A   | 8.2   | 63                  |                        |         | A   | 8.5   | 62                  |                             |         | A   | 8.5   | 66                  |
|                                            |                      | PM | 211                                     |               |         | A   | 7.8   | 63                  |                 |         | A   | 7.9   | 60                  |                        |         | A   | 8     | 60                  |                             |         | A   | 8     | 58                  |
|                                            | NB                   | AM |                                         |               |         | A   | 7.9   | 15                  |                 |         | A   | 8     | 16                  |                        |         | A   | 8.1   | 21                  |                             |         | A   | 8.1   | 20                  |
|                                            |                      | PM | 418                                     |               |         | --  | --    | --                  |                 |         | --  | --    | --                  |                        |         | --  | --    | --                  |                             |         | --  | --    | --                  |
|                                            | SB                   | AM |                                         |               |         | A   | 9.3   | 78                  |                 |         | A   | 9.7   | 79                  |                        |         | B   | 10.4  | 79                  |                             |         | B   | 10.4  | 78                  |
|                                            |                      | PM | 404                                     |               |         | A   | 8.2   | 79                  |                 |         | A   | 8.4   | 52                  |                        |         | A   | 8.6   | 51                  |                             |         | A   | 8.6   | 54                  |
|                                            |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |
| #16 9th St. and Grand<br>Ave.              | EB L                 | AM | 75                                      | A             | 9.8     | D   | 42    | 59                  | B               | 10.5    | D   | 41.7  | 72                  | B                      | 17.4    | E   | 72.7  | 85                  | B                           | 17.4    | E   | 72.7  | 86                  |
|                                            |                      | PM |                                         | C             | 20.5    | E   | 76.2  | 72                  | C               | 23.2    | E   | 76.1  | 95                  | C                      | 23.9    | E   | 75    | 98                  | C                           | 24.8    | E   | 75.3  | 102                 |
|                                            | EB T/R               | AM | 211                                     |               |         | D   | 45.4  | 75                  |                 |         | D   | 45.4  | 83                  |                        |         | F   | 88.7  | 127                 |                             |         | F   | 88.7  | 138                 |
|                                            |                      | PM |                                         |               |         | E   | 79.9  | 83                  |                 |         | F   | 80.3  | 120                 |                        |         | F   | 81.3  | 138                 |                             |         | F   | 81.3  | 133                 |
|                                            | WB L                 | AM | 75                                      |               |         | D   | 43.5  | 62                  |                 |         | D   | 43.3  | 58                  |                        |         | E   | 75.8  | 74                  |                             |         | E   | 75.8  | 76                  |
|                                            |                      | PM |                                         |               |         | E   | 71.8  | 58                  |                 |         | E   | 71.5  | 104                 |                        |         | E   | 71.3  | 91                  |                             |         | E   | 71.3  | 102                 |
|                                            | WB T/R               | AM |                                         |               |         | D   | 45.3  | 70                  |                 |         | D   | 45.2  | 70                  |                        |         | E   | 79.4  | 88                  |                             |         | E   | 79.4  | 91                  |
|                                            |                      | PM | 277                                     |               |         | F   | 91.4  | 70                  |                 |         | F   | 97.3  | 222                 |                        |         | F   | 97.3  | 200                 |                             |         | F   | 97.3  | 238                 |
|                                            | NB L                 | AM |                                         |               |         | A   | 6.9   | 116                 |                 |         | A   | 7.3   | 147                 |                        |         | A   | 8.1   | 137                 |                             |         | A   | 8.5   | 132                 |
|                                            |                      | PM | 150                                     |               |         | A   | 7.4   | 147                 |                 |         | A   | 8.1   | 144                 |                        |         | A   | 8.5   | 151                 |                             |         | A   | 8.8   | 153                 |
|                                            | NB TT/R              | AM |                                         |               |         | B   | 11.4  | 266_227             |                 |         | B   | 12.7  | 306_261             |                        |         | B   | 11.2  | 331_270             |                             |         | B   | 11.4  | 341_279             |
|                                            |                      | PM | 433_433                                 |               |         | B   | 16.9  | 306_261             |                 |         | C   | 20.4  | 553_556             |                        |         | C   | 21.1  | 548_554             |                             |         | C   | 22.9  | 523_543             |
|                                            | SB L                 | AM |                                         |               |         | A   | 8.2   | 49                  |                 |         | A   | 8.9   | 59                  |                        |         | A   | 8     | 62                  |                             |         | A   | 8.1   | 57                  |
|                                            |                      | PM | 125                                     |               |         | B   | 13.3  | 59                  |                 |         | B   | 17.8  | 73                  |                        |         | B   | 18.4  | 81                  |                             |         | C   | 21    | 90                  |
|                                            | SB TT/R              | AM |                                         |               |         | A   | 1.2   | 164_173             |                 |         | A   | 1.5   | 218_213             |                        |         | B   | 11.4  | 290_272             |                             |         | B   | 11.8  | 306_287             |
|                                            |                      | PM | 412_412                                 |               |         | B   | 10.7  | 218_213             |                 |         | B   | 11.7  | 264_251             |                        |         | B   | 12.2  | 263_247             |                             |         | B   | 12.5  | 289_274             |
|                                            |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |
|                                            |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |
|                                            |                      |    |                                         |               |         |     |       |                     |                 |         |     |       |                     |                        |         |     |       |                     |                             |         |     |       |                     |

BASELINE TRAFFIC - K-H MTS 2021 Adjusted Volumes & SGM Counts 2023

BASELINE TRAFFIC - K-H MTS 2021 Adjusted Volumes & SGM Counts 2023

\*95th percentile queue exceeds link distance  
\*95th percentile queue exceeds storage bay distance  
\*\*Modeled link distance differs from actual link distance

| Unsignalized Intersections |                             |                 |
|----------------------------|-----------------------------|-----------------|
|                            | Level of Service            | Delay (seconds) |
| A                          | (Highly Desirable)          | < 10.0          |
| B                          | (Desirable)                 | 10.1 to 15      |
| C                          | (Acceptable)                | 15.1 to 25      |
| D                          | (Acceptable in Urban Areas) | 25.1 to 35      |
| E                          | (Unacceptable)              | 35.1 to 50      |
| F                          | (Unacceptable)              | > 50            |



## Appendix F - TRIP GENERATION, REDUCTION, DISTRIBUTION, ASSIGNMENT WORKSHEET

Trip Generation - RFTA GMF  
ITE Trip Generation, 11th Edition

| Land Use                          | Number of Units | Design Hour Rates                                   |              |         |                                        |            |         |             |            | Weekday Design Hour Traffic |       |        |       |        |    |
|-----------------------------------|-----------------|-----------------------------------------------------|--------------|---------|----------------------------------------|------------|---------|-------------|------------|-----------------------------|-------|--------|-------|--------|----|
|                                   |                 | ITE Code                                            | Weekday Rate | AM Rate | AM Entering                            | AM Exiting | PM Rate | PM Entering | PM Exiting | Weekday Traffic             | AM IN | AM OUT | PM IN | PM OUT |    |
| Ph9-Park and Ride                 | 45              | 90                                                  | 4.76         | 0.73    | 0.59                                   | 0.15       | 0.58    | 0.14        | 0.43       | 214                         | 26    | 7      | 7     | 20     |    |
| Ph8-Warehousing                   | 9.6             | 150                                                 | 1.71         | 0.17    | 0.13                                   | 0.04       | 0.18    | 0.05        | 0.13       | 16                          | 1     | 0      | 0     | 1      |    |
| Ph9-Multi-Family (Mid-rise)       | 74              | 221                                                 | 4.15         | 0.28    | 0.07                                   | 0.21       | 0.39    | 0.24        | 0.15       | 307                         | 5     | 16     | 18    | 11     |    |
| Ph3-General Office Building (ksf) | 13.1            | 710                                                 | 15.11        | 2.23    | 1.96                                   | 0.27       | 2.37    | 0.40        | 1.96       | 198                         | 26    | 3      | 5     | 26     |    |
| Ph6-General Office Building (ksf) | 19.2            | 710                                                 | 14.40        | 2.11    | 1.86                                   | 0.25       | 2.18    | 0.37        | 1.81       | 277                         | 36    | 5      | 7     | 35     |    |
| Ph3/4/5/7 - 60 Bus expansion      |                 | * based on RFTA 60-bus projections (by RFTA 6/2023) |              |         |                                        |            |         |             |            | 314448                      |       |        |       |        |    |
| Total Traffic                     |                 |                                                     |              |         |                                        |            |         |             |            | 1,012                       | 97    | 45     | 41    | 101    |    |
| Total DHV                         |                 |                                                     |              |         |                                        |            |         |             |            | 142142                      |       |        |       |        |    |
| Ph9 HOUSING 10% Transit Reduction |                 |                                                     |              |         | MULTI FAMILY HOUSING Transit Reduction |            |         |             |            | 10%                         | 276   | 5      | 14    | 16     | 10 |
| Ph3 OFFICE 10% Transit Reduction  |                 |                                                     |              |         | OFFICE Transit Reduction               |            |         |             |            | 10%                         | 178   | 23     | 3     | 5      | 23 |
| Ph6 OFFICE 10% Transit Reduction  |                 |                                                     |              |         | OFFICE Transit Reduction               |            |         |             |            | 10%                         | 249   | 32     | 5     | 6      | 32 |
| Total Traffic (reduced)           |                 |                                                     |              |         |                                        |            |         |             |            | 934                         | 90    | 43     | 38    | 94     |    |
| Total DHV (reduced)               |                 |                                                     |              |         |                                        |            |         |             |            | 133132                      |       |        |       |        |    |

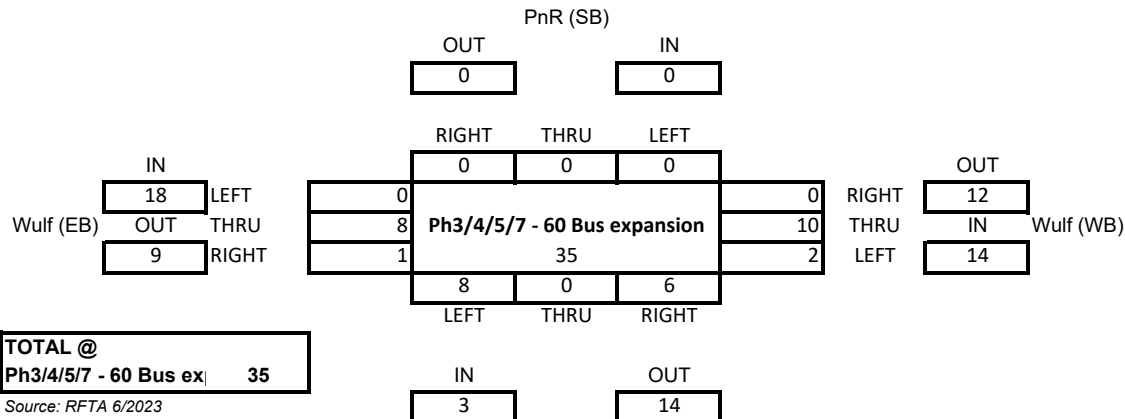
|                               | ITE Code | Basis of Rate | Time Period Used Above    | Weekday Design Hour Distribution |        |       |        |
|-------------------------------|----------|---------------|---------------------------|----------------------------------|--------|-------|--------|
|                               |          |               |                           | AM IN                            | AM OUT | PM IN | PM OUT |
| Ph9-Park and Ride             | 90       | Fitted Curve  | Peak Hour adjacent Street | 80%                              | 20%    | 25%   | 75%    |
| Ph8-Warehousing               | 150      | Ave Rate      | Peak Hour adjacent Street | 77%                              | 23%    | 28%   | 72%    |
| Ph9-Multi-Family (Mid-rise)   | 221      | Fitted Curve  | Peak Hour adjacent Street | 26%                              | 74%    | 61%   | 39%    |
| General Office Building (ksf) | 710      | Fitted Curve  | Peak Hour adjacent Street | 88%                              | 12%    | 17%   | 83%    |

| Phase         | Weekday Design Hour Traffic |        |       |        |
|---------------|-----------------------------|--------|-------|--------|
|               | AM IN                       | AM OUT | PM IN | PM OUT |
| Phase 3/4/5/7 | 26                          | 17     | 9     | 31     |
| Phase 6       | 32                          | 5      | 6     | 32     |
| Phase 8       | 1                           | 0      | 0     | 1      |
| Phase 9       | 31                          | 21     | 23    | 30     |

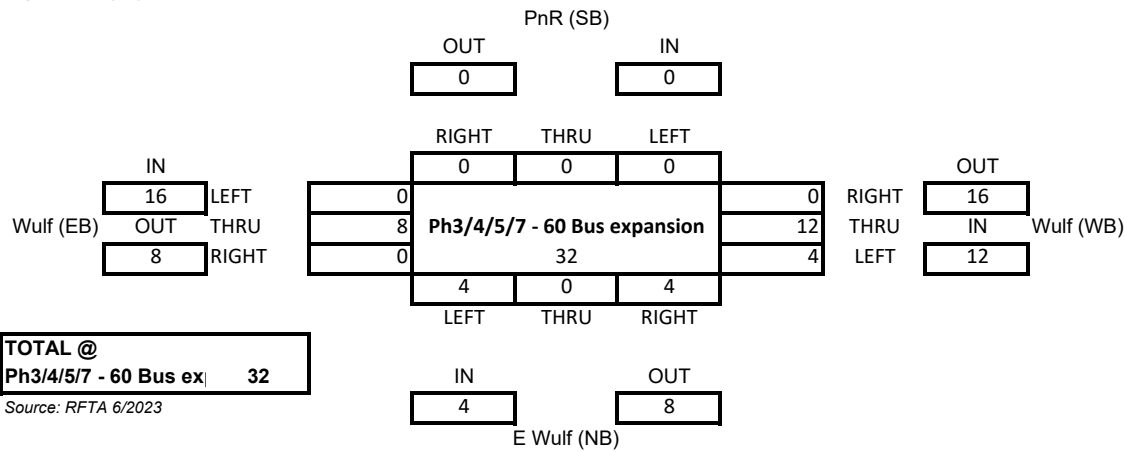
TRIP DISTRIBUTION AND ASSIGNMENT at Wulfsohn Rd and RFTA GMF / PnR

Ph3/4/5/7 - 60 Bus expansion

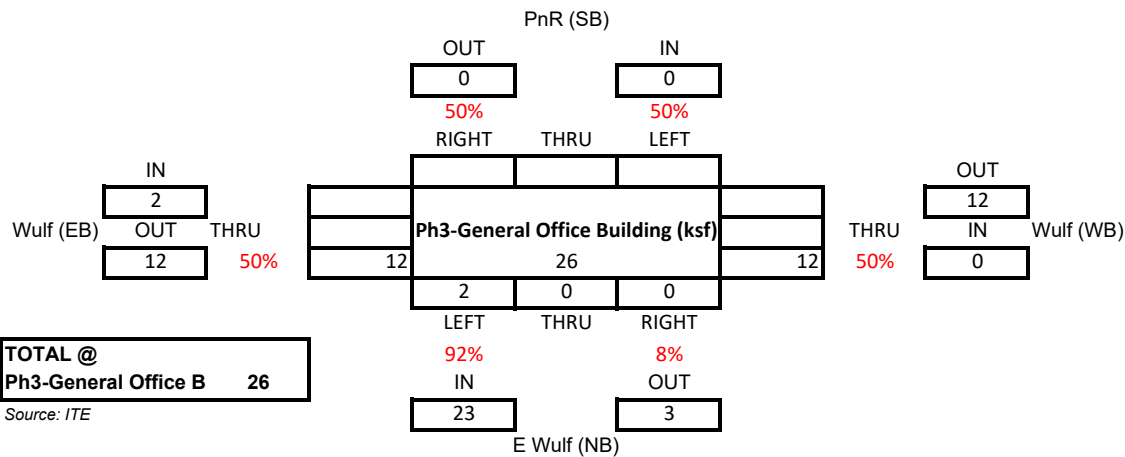
AM - Projected Bus traffic increase with expansion (60)



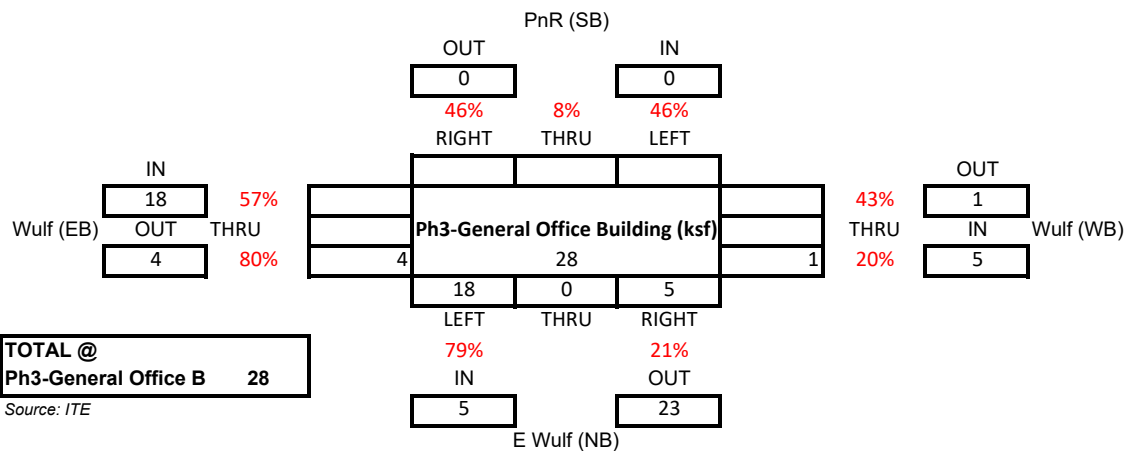
PM - Projected Bus traffic increase with expansion (60)



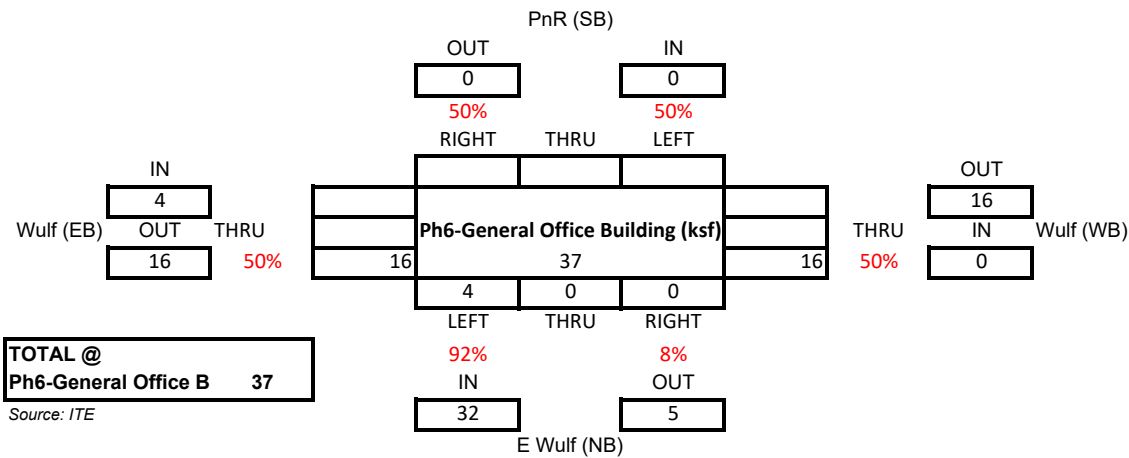
Ph3-General Office Building (ksf)  
Weekday AM



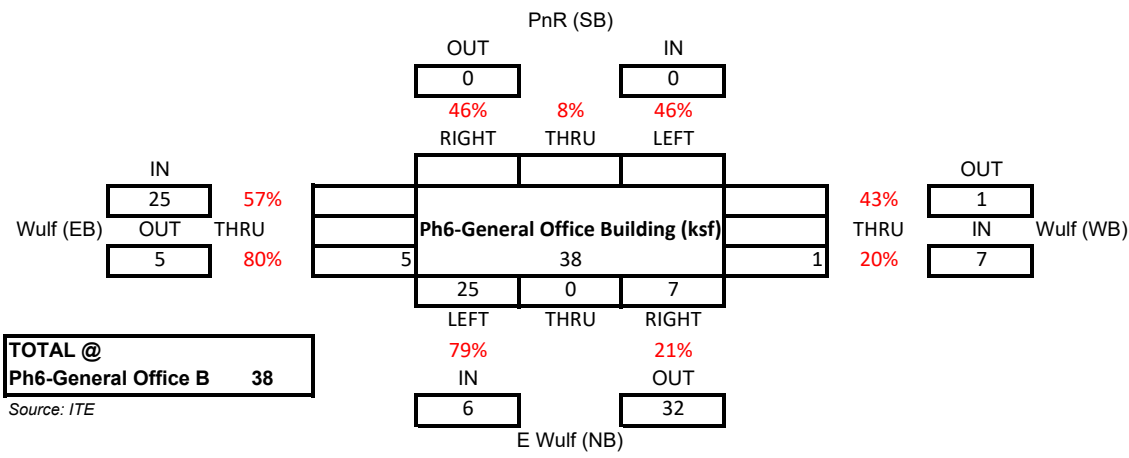
Weekday PM



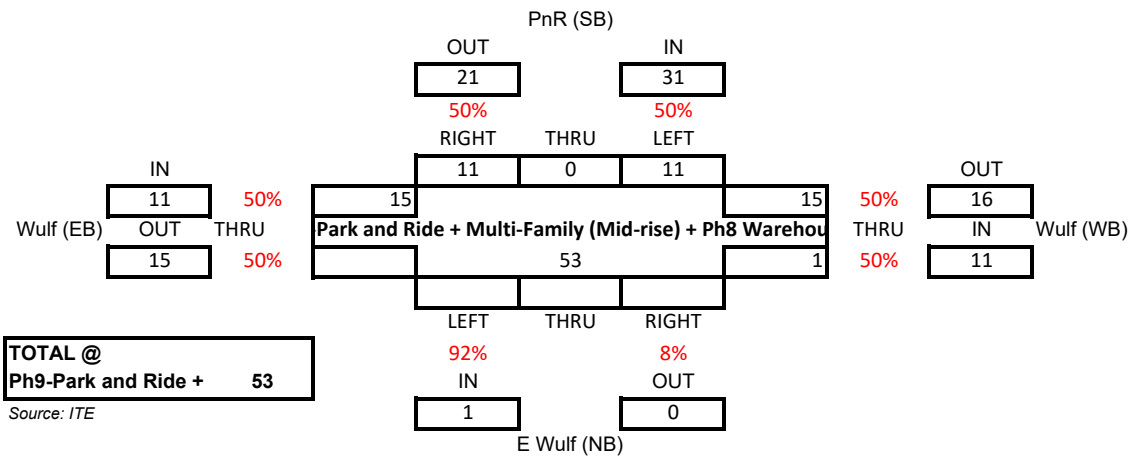
Ph6-General Office Building (ksf)  
Weekday AM



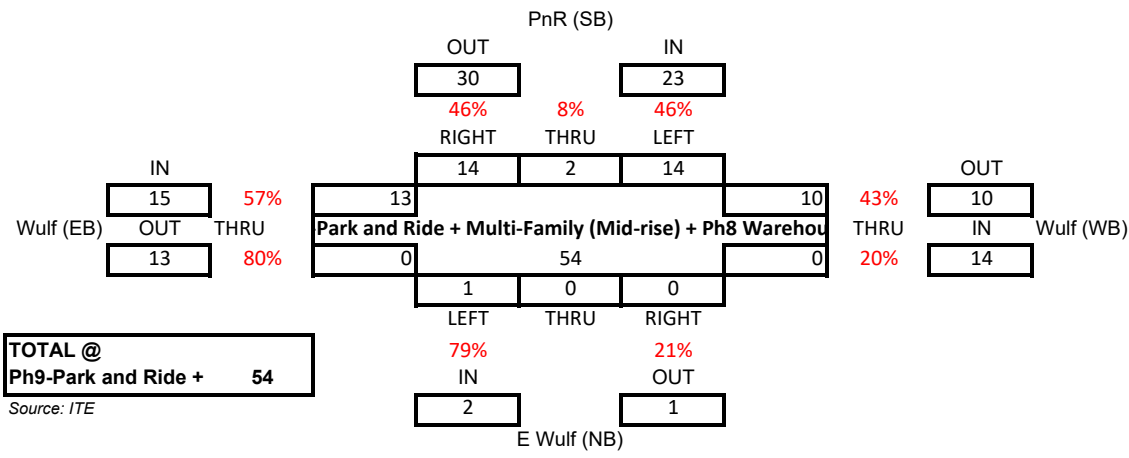
Weekday PM



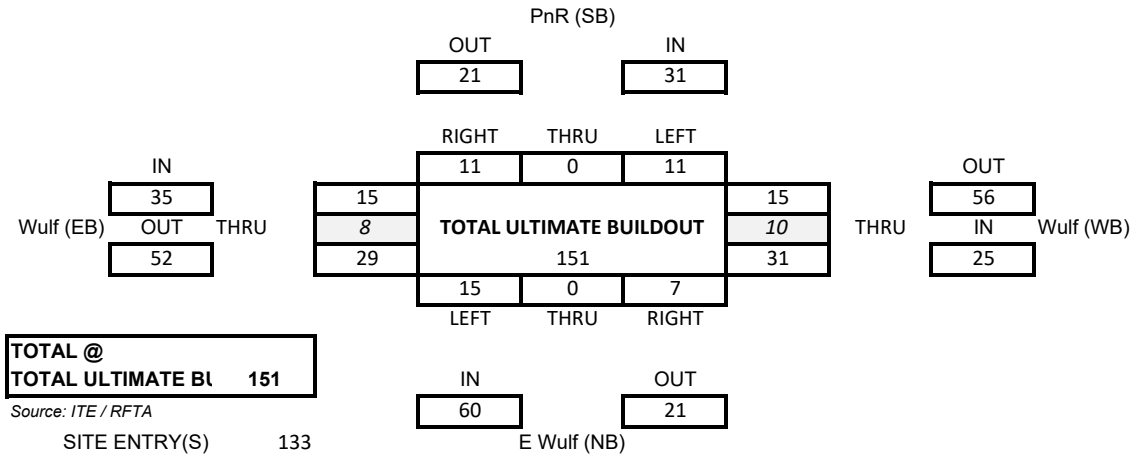
Ph9-Park and Ride + Multi-Family (Mid-rise) + Ph8 Warehousing  
Weekday AM



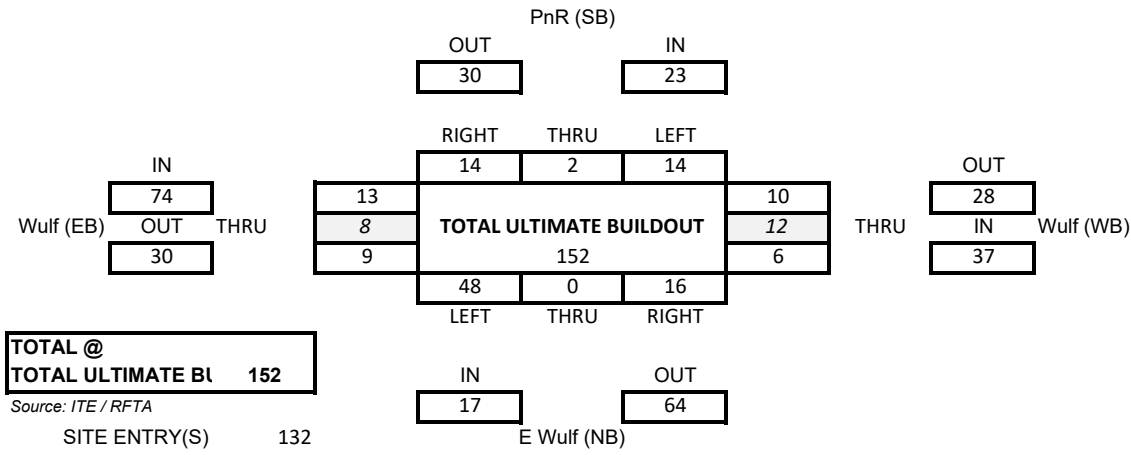
Weekday PM



TOTAL ULTIMATE BUILDOUT  
Weekday AM



Weekday PM

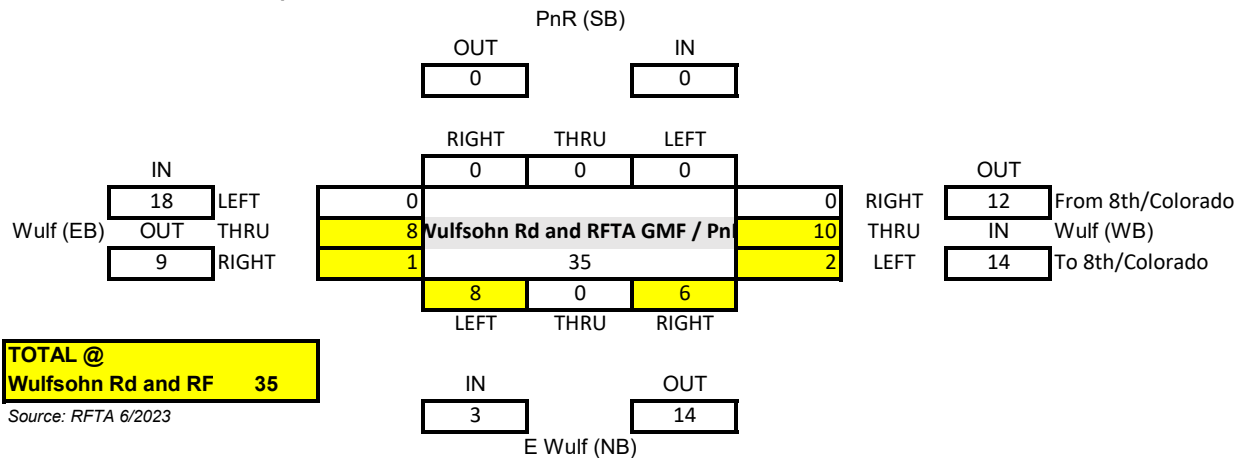


|                 |              |            | % 2023     |
|-----------------|--------------|------------|------------|
| <u>RFTA</u>     | <u>HOURL</u> | <u>DHV</u> | <u>DHV</u> |
| TOTAL           | AM           | 82         | 6.0%       |
| ULTIMATE        | PM           | 94         | 6.3%       |
| BUILDOUT        |              |            |            |
| <hr/>           |              |            |            |
| <u>2023 DHV</u> |              |            |            |
|                 | AM           | 1,359      |            |
|                 | AM           | 1,493      |            |

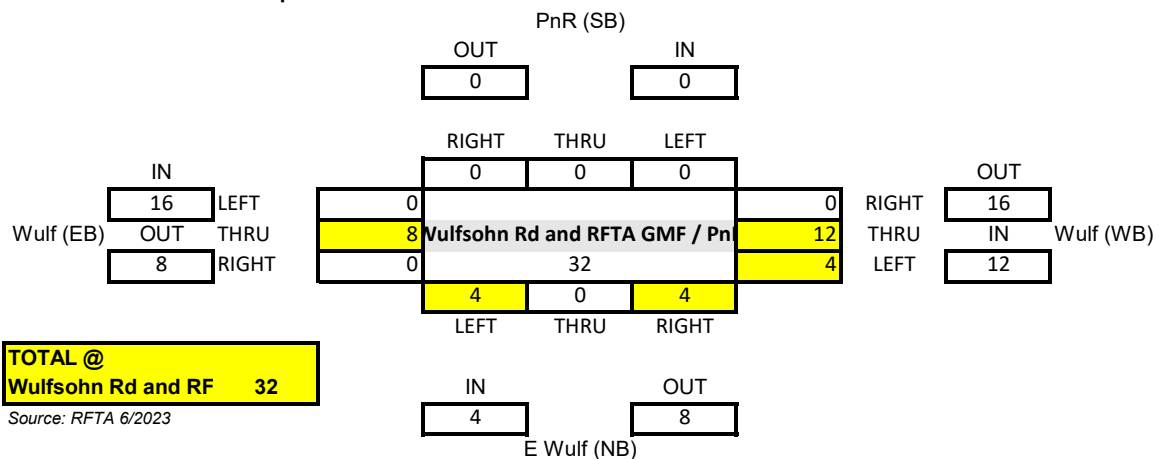


## Wulfsohn Rd and RFTA GMF / PnR

### Projected Bus traffic increase with expansion AM

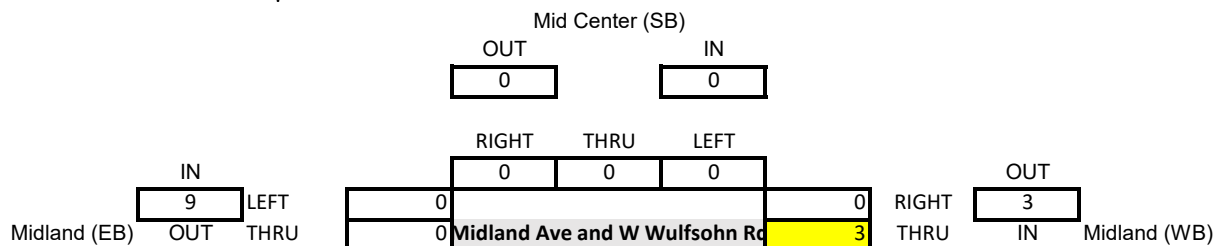


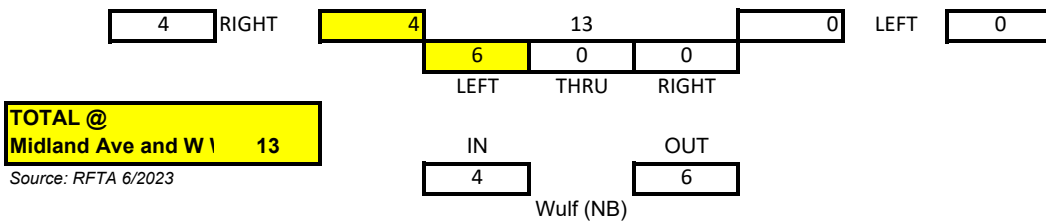
### Projected Bus traffic increase with expansion PM



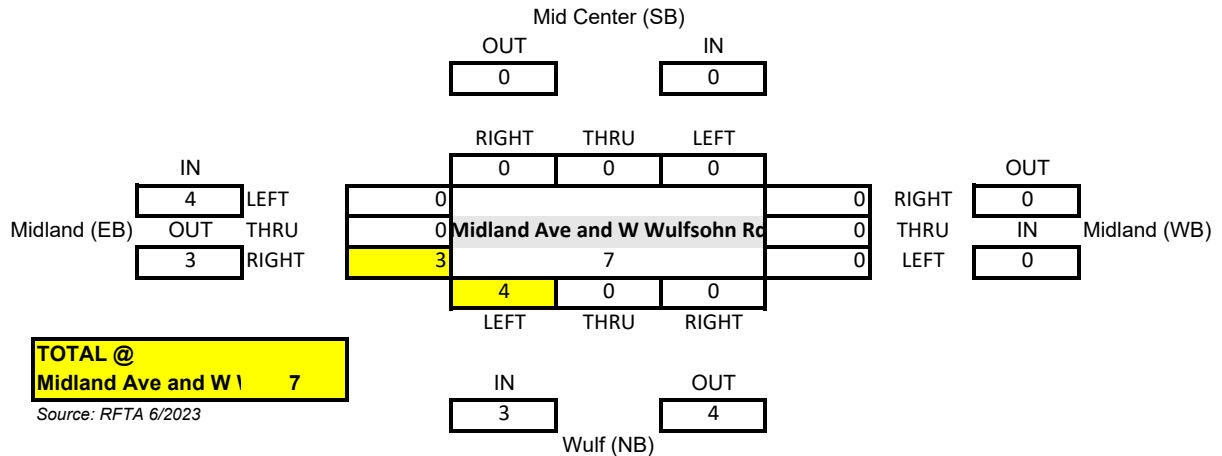
## Midland Ave and W Wulfsohn Rd

### Projected Bus traffic increase with expansion AM



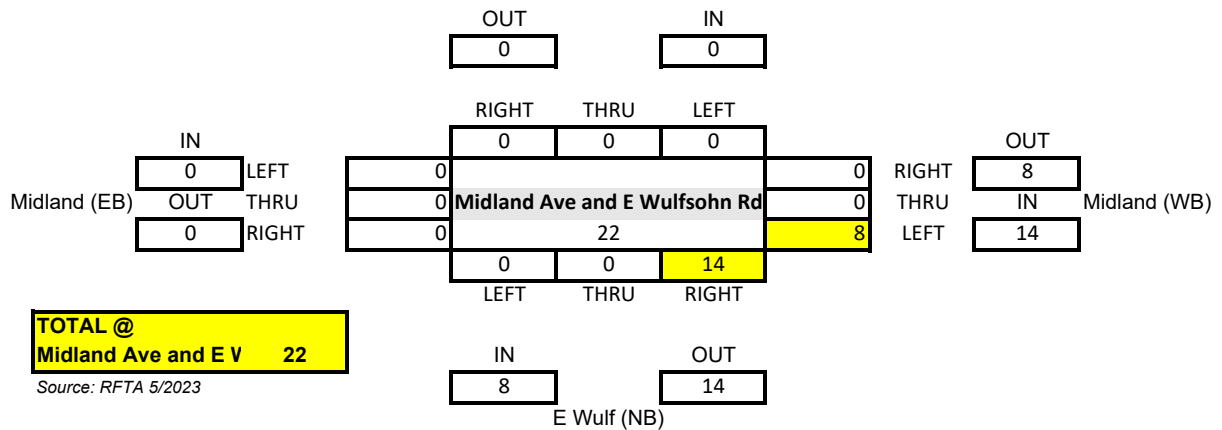


Projected Bus traffic increase with expansion PM

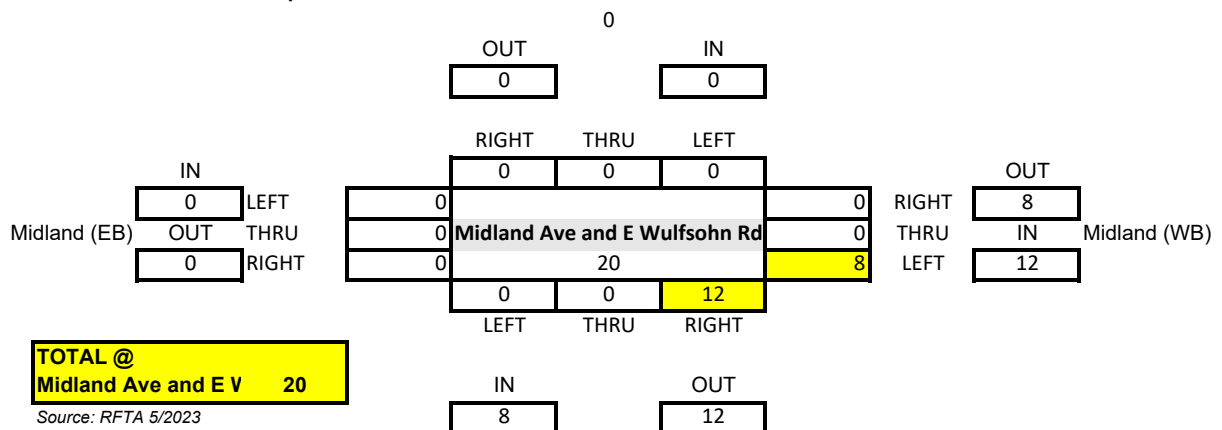


## Midland Ave and E Wulfsohn Rd

Projected Bus traffic increase with expansion AM



Projected Bus traffic increase with expansion PM





## Appendix G – PEDESTRIAN CROSSING ANALYSIS



**COLORADO**  
Department of Transportation

# COLORADO DEPARTMENT OF TRANSPORTATION



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## **Pedestrian Crossing Installation Guide**

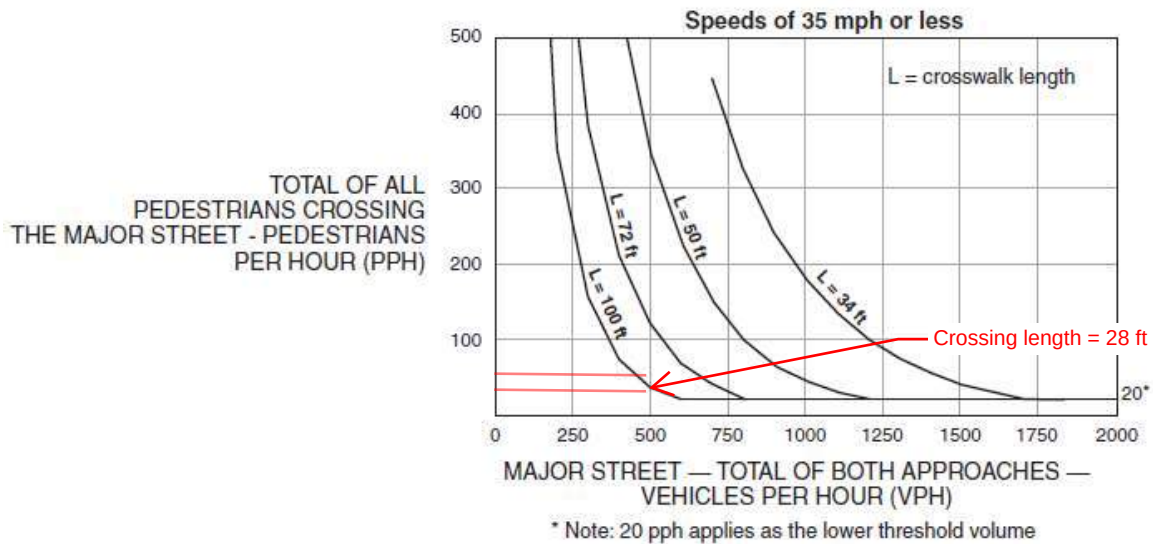
2021 Edition

## **Appendix B: Pedestrian Crossing Evaluation Worksheet**

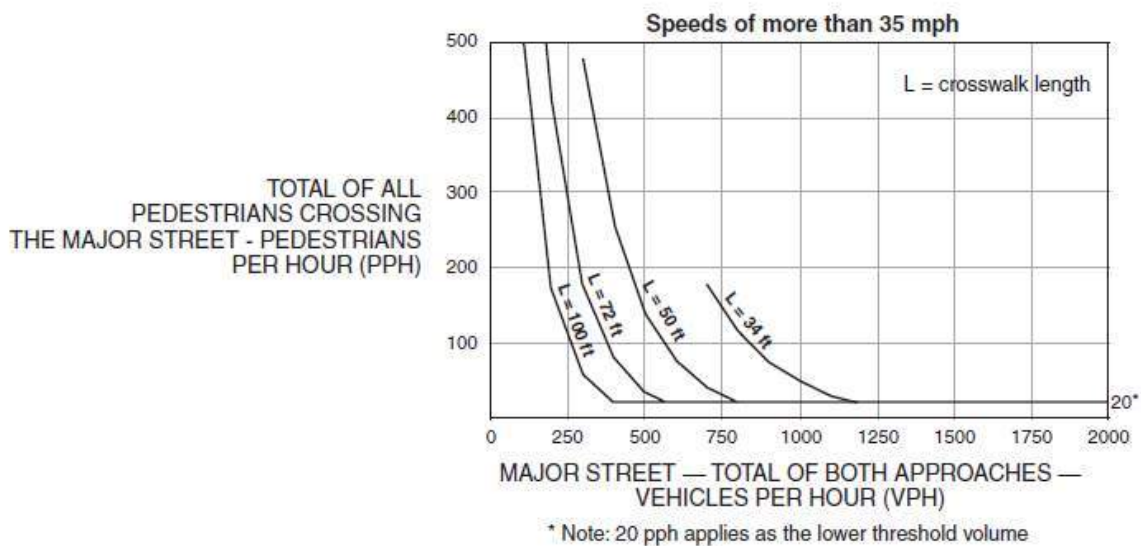
| Location Description                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------|
| <b>State Highway &amp; Milepost:</b><br>Wulfsohn Road                                                                                                                                                                                                                                                                                                                                         | <b>Major Street:</b><br>RFTA Access / PnR                                                                                     | <b>Crossing Location:</b><br><input checked="" type="checkbox"/> At Intersection <input type="checkbox"/> Mid-Block <input type="checkbox"/> Roundabout                                                                                                                                                                                                                                                                       |                                                                      |                                                          |
| <b>Existing Traffic Control:</b><br><input type="checkbox"/> Stop Sign <input type="checkbox"/> Traffic Signal <input type="checkbox"/> Uncontrolled                                                                                                                                                                                                                                          |                                                                                                                               | <b>Existing Crossing Treatments (if any):</b><br>none                                                                                                                                                                                                                                                                                                                                                                         |                                                                      | <b>Speed Limit:</b><br>25                                |
| <b>Official School Crossing:</b><br><input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                  | <b>Nearby Pedestrian Generators</b> (schools, transit stops, commercial businesses, etc.):<br>RFTA Park and Ride and RFTA GMF |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| <b>Roadway Configuration:</b><br><input checked="" type="checkbox"/> 2-Lane <input type="checkbox"/> 3-Lane w/ Striped Median <input type="checkbox"/> 3-Lane w/ Raised Median<br><input type="checkbox"/> 4-Lane <input type="checkbox"/> 5-Lane w/ Striped Median <input type="checkbox"/> 5-Lane w/ Raised Median<br><input type="checkbox"/> 6-Lane <input type="checkbox"/> Other: _____ |                                                                                                                               | <b>Crossing Distance by Direction:</b><br>Total Distance: 28<br>Dist. to Median: _____ <input checked="" type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W <input type="checkbox"/> Other _____<br>Dist. to Median: _____ <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W <input type="checkbox"/> Other _____ |                                                                      |                                                          |
| <b>Stopping Sight Distance</b> (uncontrolled locations only): 425                                                                                                                                                                                                                                                                                                                             |                                                                                                                               | Is the SSD $\geq$ 8x the speed limit? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br>If no, are improvements to SSD feasible? <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                |                                                                      |                                                          |
| Traffic Volumes and Operations                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                               | <b>AM</b>                                                                                                                     | <b>MID-DAY</b>                                                                                                                                                                                                                                                                                                                                                                                                                | <b>PM</b>                                                            | <b>OTHER</b>                                             |
| Start and End Time:                                                                                                                                                                                                                                                                                                                                                                           | to                                                                                                                            | to                                                                                                                                                                                                                                                                                                                                                                                                                            | to                                                                   | to                                                       |
| Day of Week:                                                                                                                                                                                                                                                                                                                                                                                  | Thursday                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| No. of Transit Boardings (if applicable):                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| No. of Young, Elderly, and Disabled Peds (YED):                                                                                                                                                                                                                                                                                                                                               |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| No. of Bicyclists:                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| No. of Non YED Pedestrians:                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| <b>Total Pedestrians</b> (adjusted for 2x YED):                                                                                                                                                                                                                                                                                                                                               | (13) 45                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                               | (14) 48                                                              |                                                          |
| Major Street Vehicle Volume (Daily): (2023 -184) / 2043 - 592 <b>DHV; ADT (1500 vpd) / 5000 vpd</b>                                                                                                                                                                                                                                                                                           |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| <b><u>Nearest Intersection (Direction #1)</u></b>                                                                                                                                                                                                                                                                                                                                             |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| Cross Street Name: Midland and RFTA Access(es)                                                                                                                                                                                                                                                                                                                                                |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| Located at _____ feet to the <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W of the crossing location.                                                                                                                                                                                                                            |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               | Signalized? <input type="checkbox"/> Yes <input type="checkbox"/> No |                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                               | <b>AM</b>                                                                                                                     | <b>MID-DAY</b>                                                                                                                                                                                                                                                                                                                                                                                                                | <b>PM</b>                                                            | <b>OTHER</b>                                             |
| How many times per hour did the downstream vehicle queue back up into the pedestrian crossing?                                                                                                                                                                                                                                                                                                | 0                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                               | 0                                                                    |                                                          |
| If multiple lanes per direction, are queue lengths approximately equal?                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No             | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| If no, which lane is longer (inside, outside, middle) and by how much?                                                                                                                                                                                                                                                                                                                        |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| <b><u>Nearest Intersection (Direction #2)</u></b>                                                                                                                                                                                                                                                                                                                                             |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| Cross Street Name: _____                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| Located _____ feet to the <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W of the crossing location.                                                                                                                                                                                                                               |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               | Signalized? <input type="checkbox"/> Yes <input type="checkbox"/> No |                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                               | <b>AM</b>                                                                                                                     | <b>MID-DAY</b>                                                                                                                                                                                                                                                                                                                                                                                                                | <b>PM</b>                                                            | <b>OTHER</b>                                             |
| How many times per hour did the downstream vehicle queue back up into the pedestrian crossing?                                                                                                                                                                                                                                                                                                |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |
| If multiple lanes per direction, are queue lengths approximately equal?                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No             | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| If no, which lane is longer (inside, outside, middle) and by how much?                                                                                                                                                                                                                                                                                                                        |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                      |                                                          |

## Appendix C. Figures and Tables

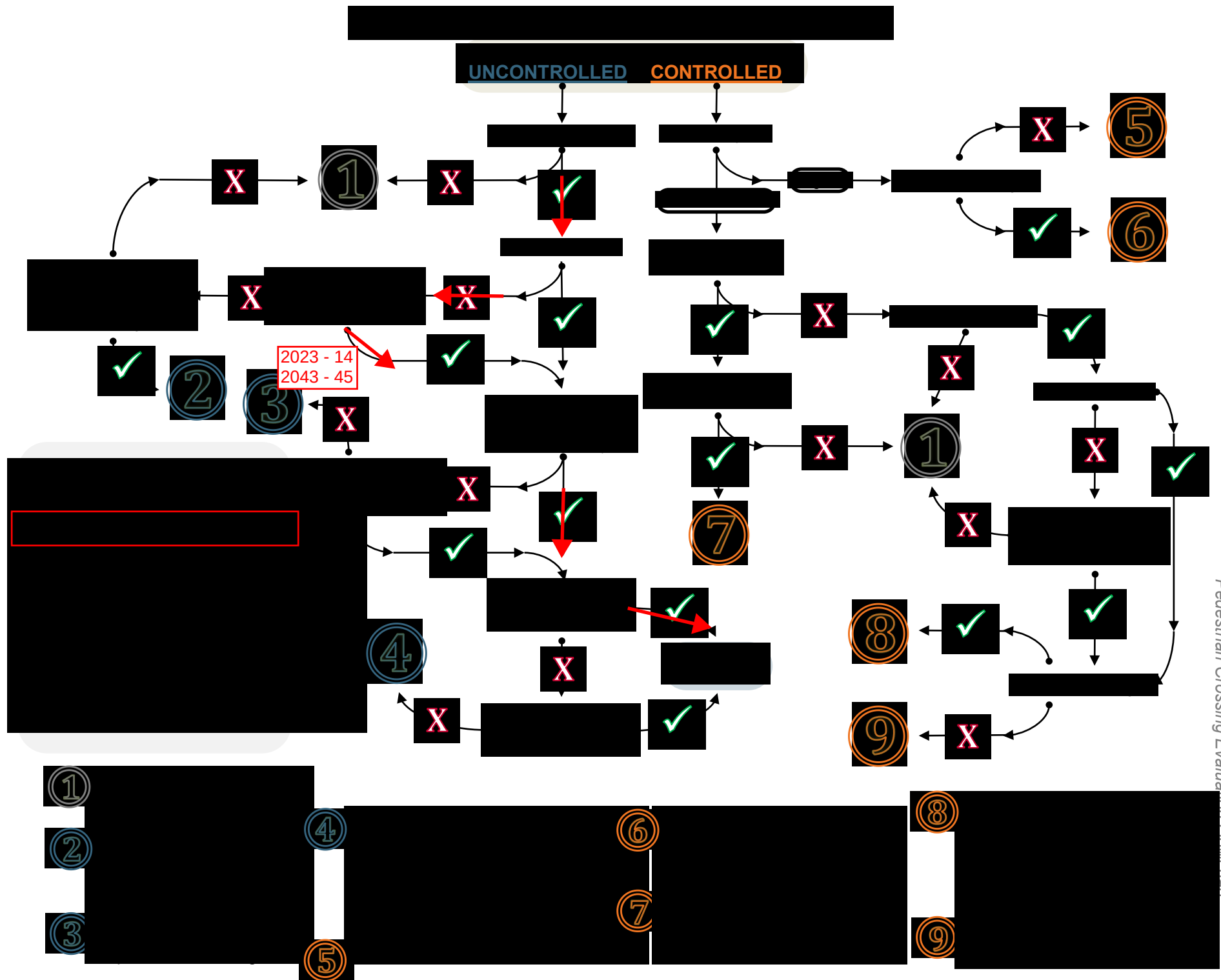
**Figure C1. Guidelines for the Installation of Pedestrian Hybrid Beacons on Low-Speed Roadways**



**Figure C2. Guidelines for the Installation of Pedestrian Hybrid Beacons on High-Speed Roadways**







**Table C1. Criteria for Pedestrian Crossing Treatments at Uncontrolled Locations**

The criteria for pedestrian crossing treatments at uncontrolled locations is intended as a general minimum. Engineering judgment should be used on a case-by-case basis. Prevailing speed may be used if significantly different than posted speed.

| Roadway Configuration                         | Roadway ADT and Posted Speed (mph) |    |    |     |                    |    |    |     |                     |    |    |     |              |    |    |     |
|-----------------------------------------------|------------------------------------|----|----|-----|--------------------|----|----|-----|---------------------|----|----|-----|--------------|----|----|-----|
|                                               | 1,500 – 9,000 vpd                  |    |    |     | 9,001 – 12,000 vpd |    |    |     | 12,001 – 15,000 vpd |    |    |     | > 15,000 vpd |    |    |     |
|                                               | ≤30                                | 35 | 40 | ≥45 | ≤30                | 35 | 40 | ≥45 | ≤30                 | 35 | 40 | ≥45 | ≤30          | 35 | 40 | ≥45 |
| 2 lanes, one-way street                       | A                                  | B  | C  | E   | A                  | B  | C  | E   | B                   | B  | C  | E   | B            | C  | C  | E   |
| 2 lanes, two-way street with no median        | A                                  | B  | C  | E   | A                  | B  | C  | E   | B                   | B  | C  | E   | B            | C  | C  | E   |
| 3 lanes with raised median                    | A                                  | B  | D  | E   | A                  | C  | D  | E   | B                   | D  | D  | E   | C            | D  | D  | E   |
| 3 lanes without raised median                 | C                                  | C  | D  | E   | C                  | C  | D  | E   | C                   | C  | D  | E   | C            | D  | D  | E   |
| 4 lanes with raised median                    | A                                  | B  | C  | E   | A                  | B  | C  | E   | B                   | B  | C  | E   | B            | C  | C  | E   |
| 4 lanes, two-way street without raised median | A                                  | D  | D  | E   | B                  | D  | D  | E   | B                   | D  | D  | E   | D            | D  | D  | E   |
| 5 lanes with raised median                    | A                                  | B  | D  | E   | B                  | C  | D  | E   | B                   | C  | D  | E   | C            | C  | D  | E   |
| 5 lanes without raised median                 | D                                  | D  | D  | E   | D                  | D  | D  | E   | D                   | D  | D  | E   | D            | D  | D  | E   |
| 6 lanes with or without raised median         | F                                  | F  | F  | F   | F                  | F  | F  | F   | F                   | F  | F  | F   | F            | F  | F  | F   |

#### Treatment Descriptions:

- ☐ A. Install marked crosswalk with enhanced roadside signs.

*Install a marked crosswalk with a standard W11-2 with a W16-7p plaque mounted on the side of the roadway at the crosswalk location and a standard W11-2 advanced pedestrian warning sign. Use S1-1 signs for school crossing locations. An optional R6-1 may be used in addition.*

- ☐ B. Install marked crosswalk with enhanced roadside and in-roadway signs.

- ☐ C. Install marked crosswalk with enhanced signs and geometric improvements to increase pedestrian visibility and reduce exposure.

- ☐ D. Install marked crosswalk with enhanced signs, pedestrian activated RRFBs, and geometric improvements to increase visibility pedestrian and reduce exposure.

- ☐ E. Do not install marked crosswalk at uncontrolled crossing. Determine if speed limit can effectively be reduced to 40 mph by making geometric or other infrastructure changes (i.e., bulb out, median refuge, etc.). If so, utilize criteria D above. If this is not possible, if pedestrian volume meets warrants, consider a pedestrian hybrid beacon, pedestrian traffic signal, or grade separated crossing.

- ☐ F. Do not install marked crosswalk at uncontrolled crossings with three (3) or more through lanes per direction or where the speed limit is greater or equal to 45 mph and/or there is not a median refuge on a 5-lane crossing. Consider pedestrian hybrid beacon, pedestrian traffic signal, or separated crossing.

## **Appendix C: Preliminary Soil, Geotechnical, and Geohazard Report**



## REPORT

# RFTA Glenwood Maintenance Facility Phase 6 - Administration Building and BRT Station

*Final Geotechnical Report*

Submitted to:

**Eric Rolle, PE**

Shrewsberry and Associates, LLC  
2629 S. Colorado Blvd, Suite 460  
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Submitted by:

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20365011-002-RPT-0

August 25, 2023

## Distribution List

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### APPENDIX A

Borehole Logs

### APPENDIX B

Laboratory Testing

### APPENDIX C

Drilled Shaft Axial Capacity Charts

## 1.0 INTRODUCTION

### 1.1 Project Overview

Shrewsberry & Associates, LLC has retained WSP USA Inc. (WSP) to perform a preliminary geotechnical engineering study as part of their support to Roaring Fork Transportation Authority (RFTA) for Part II of the RFTA Glenwood Springs Maintenance Facility (GMF) Phase 6-Administration Building and Bus Rapid Transit (BRT) Station, located at the intersection of Midland Avenue and Wulfsohn Road in western Glenwood Springs, Colorado. This report presents the results of the geotechnical investigation and contains preliminary geotechnical recommendations for the proposed development.

The project site is the RFTA Glenwood Maintenance Facility (GMF) located in Glenwood Springs, Colorado shown in Figure 1.

The specific project site location as well as borehole locations are shown in Figure 1.



Figure 1: Borehole Locations

## 1.2 Scope of Services

WSP provided the following services as outlined in the scope of work dated December 27, 2022.

- A field investigation program that included drilling five boreholes. A detailed description of the field investigation program is provided in Section 2.1. Borehole logs are included in Appendix A.
- Laboratory testing on representative soil samples collected during the field investigation to determine material classification and subsurface conditions at the project site relative to the proposed construction.
- Engineering analysis and preparation of preliminary geotechnical recommendations for the foundation type, site preparation methods, and development risks for the proposed development.
- Preparation of this report summarizing the findings and our recommendations.

## 2.0 GEOTECHNICAL FIELD INVESTIGATION

### 2.1 Geotechnical Drilling Investigation

Five geotechnical boreholes were drilled within the proposed development from May 1 to May 4, 2023. The Locations of the boreholes are shown in Figure 1. A summary of the borehole coordinates is provided in Table 1.

**Table 1: Summary of Boreholes**

| BOREHOLE IDENTIFIER (ID) | DEPTH (FT) | LATITUDE <sup>1</sup> | LONGITUDE <sup>1</sup> | APPROXIMATE ELEVATION (FT) <sup>2</sup> |
|--------------------------|------------|-----------------------|------------------------|-----------------------------------------|
| BH-1                     | 85         | 39.557560             | -107.353959            | 5809                                    |
| BH-2                     | 85         | 39.557700             | -107.354609            | 5801                                    |
| BH-3                     | 5          | 39.557472             | -107.354639            | 5802                                    |
| BH-4                     | 85         | 39.558321             | -107.354278            | 5786                                    |
| BH-5                     | 5          | 39.557354             | -107.354186            | 5810                                    |

Notes:

ID = identifier

Ft = feet

1 = locations not surveyed. Coordinates provided from a handheld global positioning system (GPS) device or estimated from mapping tools.

2 = Elevations estimated from contours.

The borehole logs (Logs of Boreholes), provided in Appendix A, list the borehole identifier and drilling date, and describe the earthen materials encountered and depths of soil samples that were collected. The boundaries between different soil types (if encountered) shown on the logs are approximate because the actual transition between soil layers may be gradual.

A Central Mine Equipment Company (CME) CME-75 truck-mounted drill rig owned and operated by Dakota Drilling, LLC of Denver, Colorado, was used to advance the geotechnical boreholes and to obtain soil samples for observation, description, classification, and testing. The boreholes were advanced using an eight (8) inch hollow-stem auger for both five-foot holes and down hole hammer drilling with air as the flushing medium (Overburden Drilling Eccentric, ODEX) for the three deep holes.

Standard Penetration Tests (SPTs) were conducted in general accordance with American Society for Testing and Materials (ASTM) Method D1586. Samples were collected for field classification using a Standard Penetration Test (SPT) split-spoon barrel sampler and a modified California split-spoon brass ring-lined barrel sampler for

collecting undisturbed samples at regular intervals, including depths of two and five feet, and then every five feet up to a depth of 85 feet below ground surface (ft-bgs) when possible. The samples were driven either 18 inches (standard split-spoon sampler) or 12 inches (modified California split-spoon sampler), or until refusal, into the soil at the bottom of the borehole. Soil is retained inside the split barrel shaft and is visually classified. The split-spoon sampler was driven with a 140-pound hammer freely falling from a height of 30 inches. The number of blows required for each six inches of penetration was recorded. The number of blows required to advance the sampler the last 12 inches is the penetration resistance N-value, or blow count, and provides a qualitative measure of the relative density of cohesionless soils or consistency of cohesive soils. The N-value recorded in the field for each SPT is shown on the borehole logs included in Appendix A. The SPTs were conducted using a rope and cathead with a safety hammer. The energy efficiency of this system is estimated to be approximately 60 percent of the theoretical free-fall energy. Therefore, for geotechnical correlations based on 60 percent efficiency, the SPT blow counts were used without correction.

Samples collected from the SPT split-spoon samplers were placed and sealed in plastic bags. Ring samples were placed in capped plastic tubes lined with plastic bags. WSP geotechnical personnel were present throughout the field investigation to observe the drilling and to record SPT blow counts. Soils were classified in general accordance with ASTM D 2488, "Standard Recommended Practice for Description of Soils (Visual-Manual Procedure)". The boring logs present soil descriptions based on the field classifications that have been updated where necessary based on the results of the laboratory testing in accordance with ASTM D 2487, "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)".

## 2.2 Geotechnical Laboratory Testing

Geotechnical laboratory testing was performed on selected samples from the field investigation by WSP's Phoenix laboratory to substantiate field classifications and to provide engineering properties necessary for developing preliminary geotechnical design recommendations.

The laboratory testing program included sieve (grain-size) analysis, Atterberg Limit tests (plasticity), and moisture determination. Tests are performed in accordance with the standard procedures listed in Table 2, below. The laboratory test results are presented in Appendix B. The soil samples were also checked against the field classifications, which were then updated as appropriate in accordance with ASTM Method D2487.

**Table 2: Geotechnical Test Methods Applied to Representative Soil Samples**

| GEOTECHNICAL TEST                  | TEST METHOD           | NUMBER OF TESTS |
|------------------------------------|-----------------------|-----------------|
| In-situ Moisture Content           | ASTM D2216            | 18              |
| Sieve (Grain-Size) Analysis        | ASTM C136/C117        | 21              |
| Atterberg Limits (Soil Plasticity) | ASTM D4318            | 21              |
| Collapse Potential of Soils        | ASTM D5333            | 3               |
| R-Value                            | ASTM D2844            | 1               |
| Modified Proctor                   | ASTM D1557            | 1               |
| pH and Resistivity                 | ASTM D6276/D4972/G187 | 2               |
| Soluble Sulfates and Chlorides     | ASTM G516/D512        | 2               |

Notes:

ASTM=American Society for Testing and Materials

### 3.0 SITE CONDITIONS

The elevation of the site is approximately 5,800 feet above mean sea level (ft amsl). Much of the site is paved for parking or roadways as part of the existing RFTA facilities. The north portion of the site investigated for this project included an area that had recently been rough graded with approximately 10 to 15 feet of new fill, and portions of the area were being used for construction trailers for the current construction activity at the site. Evidence of recent debris flow events can be observed on the surface in the drainage to the west of the GMF and debris flows are known to occur in the channel that reports to a ditch just uphill of the GMF, and in channels that are mitigated by a larger berm to the southeast.

The RFTA GMF is a very active bus depot and bus maintenance facility that has on-going large-scale construction south of the geotechnical drilling locations. Four of the five boreholes are located within the overflow and employee parking lot. The last borehole is located just north of the public parking lot fill placed in the past several years. The parking lot and bare soil surfaces were relatively dry and accessible on the days of drilling.

### 3.1 Regional Geology

The site is on the south side of the Colorado River Valley at the west end of the wide area that is occupied by the City of Glenwood Springs. The valley is an erosional feature formed within the Maroon Formation by the Colorado River with the upper part of the Eagle Valley Evaporite Formation exposed sporadically near the valley floor. Quaternary deposition of alluvial river gravels has occurred over the bedrock then eroded to form the current channel of the river. The most recent deposition is the numerous debris fans upon which much of Glenwood Springs has been constructed, especially over the past 20 years. The site is located on the western edge of an active debris fan that likely overlies river gravels deposited on sandstone or evaporite bedrock.

The reddish colored Maroon Formation sandstone, arkosic sandstone, shale, and siltstone layers dip steeply to the south in this area as the Grand Hogback feature turns east then south along the boundaries of Glenwood Springs. The south dipping strata exposed by the north-facing slope results in steep cliffs over which surface water flows causing intense erosion and subsequent debris flows. The Maroon Formation is associated with frequent debris and mud flow events wherever it outcrops in Western Colorado. Debris flow mitigation has been installed previously to protect this and other sites on the fan.

### 3.2 Debris Fan Formation

The project site is located on an active debris fan, as noted above. The term active refers to the fact that debris flows generally occur every few years and deposit material behind existing mitigation berms or in ditches and must be regularly cleaned by the City of Glenwood springs. Understanding the nature of debris fans and their formation will help with the understanding of the unique geologic hazards and geotechnical conditions at the site.

Debris fans form when transported soil is deposited during intense precipitation or snowmelt event. Fans develop over hundreds to thousands of years as subsequent flows cause erosion and deposition of material, which changes the topography near the channel causing subsequent flows to deposit on other parts of the fan. This process is known as avulsion and channel relocation can be caused by surface elevation changes or by drainage channels being blocked by logs and boulders. Over time, a relatively uniform, fan shaped feature forms.

Overburden soils underlying the site near the planned improvements consists primarily of rocky, clayey, sandy, silty alluvial soils deposited by debris flow events originating from drainage basins to the south of the site. Rapid deposition of soil and rock comprising a flow occurs because the gradient of the fan is less than the gradient of the channel above the apex. Flow material consists of water with 25% to 45% entrained solids by volume. As the



flow slows on the fan, deposition occurs as the water content and fluid shear stresses decrease. Some flows are more viscous than others and some have higher percentages of gravel, cobble and boulder sized material. Flows also exhibit variable amounts of logs, organic material and charcoal which can be included in the soils that comprise the fan. The fan is essentially made up of lenticular deposits that are the width and height of the flow events that deposited them.

The depositional environment on the fan results in subsurface conditions that include low density soils with an unstable structure that are prone to collapse when wetted. Buried logs or other accumulations of organics can be problematic for foundations if they are near the surface. Variable amounts of rock clasts can cause differential permeability between layers resulting in seasonal perched water tables that can cause unexpected hydro collapse or can cause constructability issues.

### 3.3 Generalized Subsurface Conditions

Important points related to the subsurface conditions at the sites are summarized below:

- BH-1, BH-2, BH-3, and BH-5 were drilled through asphalt and approximately 6 inches of base course. BH-4 began in fill material which was very similar to the native soil described below.
- Silty Sand / Silty Gravel (SM/SG) soils with 25 to 45 percent non-plastic fines were observed in all boreholes. It was described as red to brownish red, with gravel percentages between 0 and 28 percent.
- SPT N60 values averaged approximately 20 to 30. No distinct layering was identified (see Figure 2), but blowcounts in excess of 40 occurred sporadically between elevation 5,780 and 5,755, and again below 5,735 in BH-2, likely indicative of cobbles or boulders.
- Boulders and cobbles up to 2 feet in diameter were noted by the driller.
- The dense alluvial gravels layer was not definitively encountered in any of the boreholes but could have potentially been encountered at the bottom of BH-2. This layer was encountered at a depth of approximately 100 feet in nearby boreholes for the GMF expansion project.
- No significant organic material was encountered in any of the boreholes.

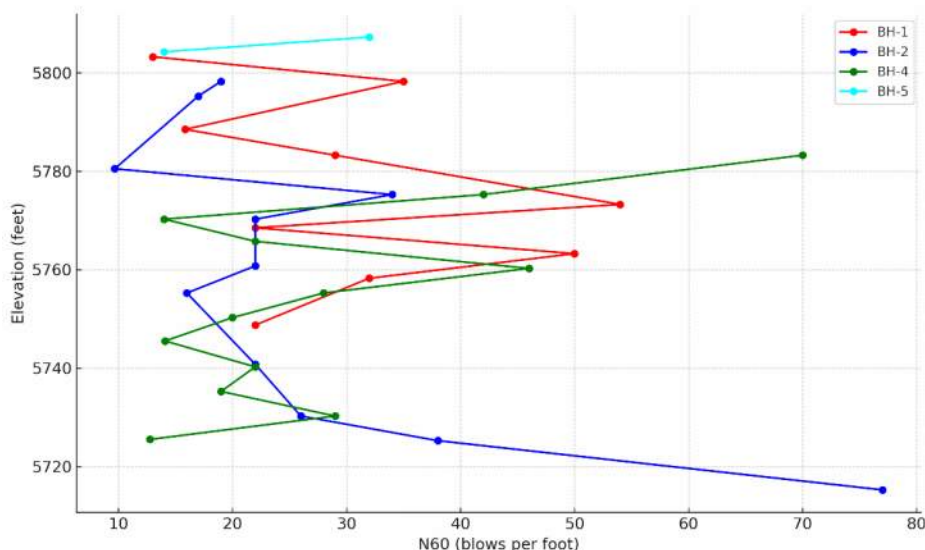


Figure 2: Plot of N60 Blowcounts versus Elevation

### 3.4 Groundwater

Groundwater was not encountered in any of the boreholes advanced at the site. The site is approximately 120 feet above the Colorado River, so the groundwater depth is estimated to be near that elevation. Borehole observations are representative of groundwater conditions at the time of WSP's field exploration and may not be indicative of other times. It should be noted that the presence of subsurface water can be influenced by changing factors including varying seasonal and weather conditions.

### 3.5 Geologic Hazards

Geologic hazards relevant to this site include potentially hydro-collapsible soil, and debris flows. No soils with high swell potential were encountered on this project site. Further discussion regarding identified geologic hazards is provided in the following paragraphs.

#### 3.5.1 Collapsible Soil

Hydro-compactive or collapsible soils are subject to significant volume reduction when wetted while subject to foundation loading. This volume reduction occurs primarily because of the dissolution of cementitious materials, such as calcium carbonate, that bond soil particles or softening of desiccated clay colloids that support flocculated soil fabrics. The wetting and loading history of the soil influences the collapse potential, and a soil may collapse under even relatively low loads, when the soil moisture content exceeds past levels. Often, the placement of a new structure changes the drainage or evapotranspiration regime of the soil, increasing the likelihood of a collapse event (Houston et al. 2002).

Hydro compaction represents the largest risk for construction on debris fans. Other nearby investigations have identified collapse potentials greater than 10% at low normal pressures. There are several examples of structures in Glenwood Springs that experienced unacceptable deformations because of hydro-collapse, including facilities at the GMF.

On parts of the fan that have not been graded or altered, the upper depth of soil has been wetted many times and is therefore less susceptible to collapse unless a significant additional vertical load is applied. The depth of wetting from surface infiltration on the undisturbed parts of the fan is typically assumed to be less than 20 feet, however the site is on a highly disturbed part of the fan where grading cuts and fills may have exposed previously unwetted soils increasing the potential for future collapse with changing moisture content and loading.

Three hydro-collapse tests were performed for this project, and the measured hydro-collapse strain at a normal pressure of 4 ksf ranged from approximately 2 to 4 percent. This demonstrates that hydro-collapse potential exists at the site, even at depths of up to 40 feet below grade.

Ponding of water, shallow unpaved gradients, poorly designed or constructed foundation drainage systems, and other potential sources of wetting should be avoided or mitigated.

#### 3.5.2 Debris Flows

There are several drainage basins up gradient of the RFTA facility that have the potential for generating debris flows. For the most part, these have been mitigated by berms or ditches. We understand that they have generally performed well and the COGS cleans them periodically after flow events.

One basin just east of the site produced a series of debris flows during the time the geotechnical investigation was being conducted. These flows were significant enough to cover the road and require substantial maintenance efforts to clear. But they do not threaten the proposed facilities for this project.

## 4.0 GEOTECHNICAL RECOMMENDATIONS

### 4.1 Geotechnical feasibility

The following recommendations are based on the field investigation, laboratory testing, and geotechnical analyses conducted for the project. WSP believes that it is feasible to construct the proposed facilities and associated improvements based on geotechnical considerations, provided the recommendations contained in this report are properly considered and implemented in the planning, design, and construction phases of the project.

### 4.2 Seismic Design of Structures

Application of the American Society of Civil Engineers 7 Standard 2022 (ASCE 7-22) to the project site yielded a design spectrum with peak ground acceleration (PGA) value, modified to the site, of 0.21g (21 percent of gravity). Seismic design parameters for the project site can be found in Table 3.

**Table 3: Seismic Design Parameters (ASCE 7-22)**

| Parameter                                                             | Design Value |
|-----------------------------------------------------------------------|--------------|
| Site Classification                                                   | CD           |
| Building Risk Category                                                | III          |
| PGA <sub>M</sub> – Site modified PGA                                  | 0.21g        |
| <b>Spectral Response Acceleration</b>                                 |              |
| S <sub>S</sub> – MCE <sub>R</sub> ground motion for 0.2 second period | 0.32g        |
| S <sub>1</sub> – MCE <sub>R</sub> ground motion for 1.0 second period | 0.057g       |
| S <sub>MS</sub> – Site modified S <sub>S</sub>                        | 0.36g        |
| S <sub>M1</sub> – Site modified S <sub>1</sub>                        | 0.1g         |
| S <sub>DS</sub> – Numeric seismic design value at 0.2s SA             | 0.24g        |
| S <sub>D1</sub> – Numeric seismic design value at 1.0s SA             | 0.069g       |
| T <sub>L</sub> – Long-period transition period                        | 4 seconds    |
| Seismic Design Category                                               | B            |

The V<sub>s100</sub> shear wave velocity, or the average shear wave velocity in the top 100 feet, was taken as approximately 1,400 ft/sec based on seismic data collected by Collier Geophysics (2022) for the maintenance facility.

### 4.3 Hydro Collapse and Geotechnical Risk

There is real risk of post-construction settlement caused by hydro-collapse based on the history at the site and nearby and corroborated by the field and laboratory testing. The likelihood of this occurrence is difficult if not impossible to predict. The consequence or magnitude of the potential hydro-collapse settlement depends on the thickness of the potentially collapsible deposit that is partially to fully wetted. Assuming 20 to 60 feet of the deposit is wetted, and using the laboratory collapse data, we estimate that the potential hydro-collapse settlement under anticipated building loads could range from 2.5 inches to greater than 7 inches. Because the lab results for this project showed collapse of 4% or less, the actual hydro-collapse settlement could be significantly more given that laboratory collapse tests from other nearby boreholes have shown collapse potential up to 10%.

One approach to hydro-collapse mitigation is to try to prevent wetting of the subsurface. This approach is not recommended as it is difficult to implement with any degree of certainty in the results. However, incorporating means to prevent moisture infiltration should still be a component of the project, just not the sole means of mitigation. WSP believes that this risk warrants mitigation in the form of ground improvement and/or deep foundations. This recommendation is in line with the approach being taken on the current maintenance facility construction.

### 4.4 Ground Improvement Recommendations

There are two types of ground improvement that WSP believes are suitable for this project: drilled displacement grout columns and compaction grouting.

#### 4.4.1 Compaction Grouting

Compaction grouting involves drilling a hole and using the hollow drill stem to inject a low-slump grout at high pressure from the bottom up to densify the soil around the hole and form a rigid column. This method of ground improvement has been used on RFTA GMF facilities both for remediation of hydro-collapse settlement, and during construction to proactively mitigate potential hydro-collapse.

#### 4.4.2 Drilled Displacement Grout Columns

Drilled displacement grout columns use a foundation drill rig equipped with a drill bit with a counter-flighted auger tip. This drill tip uses the torque and crowd pressure of the drilling to force the soil laterally as it advances, so no soil spoils are generated at the surface. Once the target depth is reached, grout or concrete is pumped through the hollow drill stem as the drill stem is withdrawn. The typical column diameter is 24 inches.

#### 4.4.3 Preliminary Column Layout

WSP recommends that a preliminary compaction grouting or displacement grout column spacing of 10 feet be used with a treatment depth of 100 feet below grade for column and wall locations, and 50 feet for the remainder of the building footprint. This configuration is consistent with what is being used for compaction grouting at the GMF expansion project.

### 4.5 Foundation Recommendations

The following sections contain recommendations for both shallow and deep foundations. Shallow foundations should be constructed in conjunction with ground improvement as recommended in Section 4.4. For the deep foundation option, interior portions of the building not supported by deep foundations should be treated with ground improvement as recommended in Section 4.4.

### 4.5.1 Shallow Spread Footings

Isolated column footings and wall footings can be designed based on the recommendations provided below provided that ground improvement columns are located within 3 feet of the bottom of the footing.

- WSP recommends shallow foundations be supported on at least 2 feet of engineered fill overlying the ground improvement columns.
- Loose or otherwise disturbed soil in between ground improvement columns, if encountered at the base of the engineered fill layer, should be over-excavated and re-compacted as engineered fill in accordance with Section 5.4.
- Isolated column footings and continuous wall footings should have minimum widths of 24 and 18 inches, respectively.
- Shallow foundation should be embedded a minimum of 36 inches below grade for frost considerations or constructed in accordance with appropriate City of Glenwood Springs (COGS) building code requirements.
- Shallow spread footing foundations supported on engineered fill material overlying ground improvement, as described above, may be dimensioned using an allowable bearing capacity of 4,000 psf, when the base of the foundation is located at least 2 feet below the lowest adjacent grade.
- Continuous wall footings supported on engineered fill overlying ground improvement, as described above, may be dimensioned for an allowable bearing capacity of 3,000 psf, when located at a depth of 1.5 feet below the lowest adjacent grade.
- Total and differential settlement of column and wall footings dimensioned using the values provided above are not anticipated to exceed 1.0 inch and 0.75 inch, respectively.
- Exterior grades around the proposed building should be covered with impervious or low permeability material or soil and should drain away from the structures to avoid an accumulation of water beneath the foundations and slabs.
- Wet utilities (water, sewer, drainage, etc.) should be located away from foundations so that the water will not readily access foundation soil should any leakage occur.
- Foundation perimeter drains should be designed and constructed to eliminate the potential for surface or subsurface water to wet the foundation soils.

### 4.5.2 Slab-on-Grade Floors

Any areas to receive new concrete slab-on-grade floors should be well drained and level. The top 10 inches of subgrade should be scarified, moisture conditioned, and compacted in accordance with Section 5.4. WSP recommends placing the floor slabs on 6 inches of base course. The base course provides for drainage beneath the floor slab; provides a suitable working platform and leveling course for the construction operation, especially during adverse weather; and provides additional support to the floor slab. Base course should meet the requirements for Colorado Department of Transportation (CDOT) Class 6 aggregate base course.

Structural design of the slab should be conservatively based on a modulus of subgrade reaction of 100 pounds per cubic inch (pci). The modulus of subgrade reaction may be increased to 125 pci for slabs bearing on 6 inches of base course, as described above.

In the areas where the applied contact pressure exceeds the typical floor load, as with heavy equipment or other concentrated loads, WSP recommends isolating the equipment slab from the adjacent floor slab and designing the equipment slab as a mat foundation using the modulus of subgrade reaction as specified above. Areas adjacent to foundations should be designed to drain away from the structures to avoid an accumulation of water beneath the slabs. The designer should refer to ACI Design Manual, Section 302.1R (2019) for additional floor slab design considerations.

### 4.5.3 Drilled Shaft Foundations

WSP recommends drilled shaft foundations as the deep foundation option for this project. Driven piles may be difficult to drive to the necessary depth with the presence of boulders. Drilled shafts have been successfully constructed on the GMF site and can be excavated to the depths necessary. Drilled shafts can be combined with an interior structural floor slab system supported on elevated grade beams if desired. Drilled shaft recommendations are provided in the following sections.

Drilled shaft design was performed in accordance with the following design standards and references:

- Federal Highway Administration (FHWA) Geotechnical Engineering Circular (GEC) No. 10 - Drilled Shafts: Construction Procedures and LRFD Design Methods (Brown, Turner, and Castelli 2010)
- IBC Chapter 18 (IBC 2021)
- Minnesota Department of Transportation Geotechnical Engineering Manual (MNDOT 2021)

#### 4.5.3.1 Drilled Shaft Design Parameters

The following design parameters are recommended for drilled shaft foundation design:

- N60 (blows/ft) – 20
- Bulk Unit Weight,  $\gamma$  (pcf) – 115
- Elastic Modulus (ksf) – 600 (assumes ground improvement)
- Lateral Soil Modulus,  $k$  (pci) – 150 (assumes ground improvement)

#### 4.5.3.2 Downdrag Due to Potential Hydro-Collapse

Even though WSP is recommending ground improvement within the building footprint, it is possible that if hydro-collapse occurs at some time in the future, down drag could be applied to the drilled shafts. We assumed a zone of wetting (and subsequent hydro collapse) 30 feet thick for this analysis and that below 30 feet, the soil becomes relatively stiff again resulting in the neutral axis being at the bottom of the wetting front. The drag force varies according to the diameter of the drilled shaft as shown in Table 4.

**Table 4: Design Drag Force as a Function of Drilled Shaft Diameter**

| DRILLED SHAFT<br>DIAMETER (FT) | DOWNWARD DRAG FORCE<br>(KIPS) |
|--------------------------------|-------------------------------|
| 1                              | 150                           |
| 1.5                            | 225                           |
| 2                              | 300                           |
| 2.5                            | 370                           |



| DRILLED SHAFT<br>DIAMETER (FT) | DOWNWARD DRAG FORCE<br>(KIPS) |
|--------------------------------|-------------------------------|
| 3                              | 445                           |
| 4                              | 590                           |
| 5                              | 740                           |
| 6                              | 885                           |

Notes:

Additional guidance on how to apply drag forces is provided in Section 4.5.3.3.

#### 4.5.3.3 Axial Resistance Charts

WSP prepared a set of design charts to present the recommended drilled shaft allowable axial capacity as a function of depth for various diameter drilled shafts at both the geotechnical strength and service limit states. The resulting charts are presented in Appendix C. The parameters in Section 4.5.3.1 were used with the Beta Method for side resistance, and the O'Neill and Reese method for base resistance. Settlement calculations were performed using the O'Neill and Reese mobilized side and base resistance charts.

To size the drilled shaft foundations based on strength limit axial capacity, the following procedure should be used: draw a vertical line in Figure C-1 corresponding to the required allowable axial capacity per shaft. The intersection of the vertical line with the curve corresponding to the desired drilled shaft diameter will indicate the minimum drilled shaft length. Repeat the procedure for uplift loading using Figure C-2. The required drilled shaft length will be the greater of the depths determined using these two charts.

To estimate the settlement of the drilled shaft, you will utilize Figures C-3 to C-8. For each of these figures, draw a horizontal line at the computed drilled shaft length and determine the allowable service limit load corresponding to the selected drilled shaft diameter at a given settlement value. Plot the load determined using the figure against the settlement (indicated beneath the X-Axis on each chart). This load-displacement curve can be used with the required service limit load to calculate the estimated settlement. Note that these charts also include elastic compression of the shaft.

Drag forces should be applied to the structural strength limit state checks, but not to the geotechnical strength limit, in other words, do not add the drag force to the computed strength limit load prior to using Figure C-1 or C-2. Drag forces should be included when evaluating the geotechnical service limit state (load-displacement curve generated from C-3 to C-8).

#### 4.5.3.4 Lateral Analysis

A lateral load analysis should be performed by the structural designer once a drilled shaft is sized based on axial capacity considerations. The required length of the drilled shaft will be the longer of the lengths computed in the axial and lateral load analyses. The lateral modulus for this analysis is provided in Section 4.5.3.1.

If hydro-collapse occurs, there could be a loss in lateral resistance. This scenario can be modeled by utilizing a Y-multiplier of 1.2 on the p-y curves in the top 30 feet.

#### 4.5.3.5 Construction Considerations

Unstable excavation conditions should be expected during the drilled shaft excavation. The presence of silty sand and well-graded sand lenses are strong indicators that the sides of shaft excavations will not be stable if unsupported. **The drilled shaft contractor should anticipate the use of stabilizing techniques (e.g., temporary casing or polymer slurry) during drilling.**

The presence of cobbles and boulders is sometimes only indicated on the borehole logs by the numerous instances of sampler refusal (indicated on the logs where blow counts reached or exceeded 50 before a penetration of 6 inches was achieved), low sample recovery percentage, and by description of drilling action (e.g., auger chattering or grinding). The samplers used to perform SPTs during the field program are limited in diameter so that the largest particle that can be retrieved is less than 2.5 inches. This introduces a bias toward smaller particles in the soil samples that were collected so that the subsequent sieve analysis indicates material that is finer than the actual condition of the soil in the ground. WSP recommends that the drilled shaft contractor be prepared to retrieve rounded cobbles and boulders approximately 12 to 24 inches in diameter from the drilled shaft excavations.

All drilled shaft foundations should be constructed in accordance with Section 503 of the CDOT Standard Specifications.

The majority of the drilled shaft loads are expected to be carried in side friction resistance. However, over the long term some load will be transferred to the base of shafts. Accordingly, WSP recommends that the bottom of the drilled shafts be cleaned by at least two passes of a flat-bottom auger or cleanout bucket immediately (no more than two hours) prior to placement of the reinforcement cage and concrete.

A qualified inspector should complete a drilled shaft construction observation report for each drilled shaft constructed. The report should detail the nature of the materials encountered during shaft excavation and verify proper shaft depth and diameter, cleaning of the shaft base, reinforcement cage materials and installation, and concrete placement.

A temporary surface casing is recommended to prevent surface sloughing or ravelling and to ensure personnel safety. The casing diameter should not be more than 12 inches larger than the drilled shaft diameter. Common practice is to use a corrugated steel casing for this purpose.

Fall protection should be provided for workers at the open shaft as required by OSHA.

#### 4.6 Foundation Walls and Lateral Loads

Foundations located below grade and shear keys may derive lateral load resistance from passive resistance along the vertical sides of the foundations, friction acting on the bases of the foundations, or a combination of the two.

Active lateral earth pressures from horizontal backfills behind structures that are free to rotate at least 0.1 percent of the structure height can be designed for the active earth pressure conditions. Structures that are restrained against movement or rotation at the top should be designed for at-rest earth pressure conditions. Earth pressure coefficients and equivalent fluid pressures for these conditions are provided in Table 5 according to the material type being retained.

The recommended values do not include induced wall pressures from compaction, or construction. Care must be taken during the compaction operation not to overstress retaining walls. Heavy construction equipment should be

kept at least 3 feet away from the walls while the backfill soil is being placed. Hand-operated compaction equipment should be used to compact the backfill soils within the 3-foot wide zone adjacent to the walls. Soil/pavements at the toe of retaining walls should be in place and cured prior to backfilling. WSP should be contacted when development plans are finalized for review of wall and backfill conditions on a case-by-case basis. Sloping backfills will result in lateral earth pressures greater than those provided above.

The recommended lateral earth pressures provided above assume that adequate drainage is provided behind the walls to prevent the buildup of hydrostatic pressures. Walls should be provided with back drains and weep holes to reduce the potential for the buildup of hydrostatic pressure.

Live load surcharge pressure equivalent to a vertical height of 2-ft of earth should be applied to walls where the vehicle traffic can come within a horizontal distance from the top of the wall equal to one-half its height. Additional loads on retaining walls will be imposed by surcharge, which can be evaluated on a case-by-case basis.

Base friction coefficients to be applied to the total vertical force on the structure are provided in Table 6. Passive resistance should only be included where material provided the resistance will be available over the life of the structure (for example, passive resistance should be neglected where scour is anticipated to occur, or a subsequent excavation might be made). Ultimate passive earth pressure coefficients and equivalent fluid pressures for various site materials are provided in Table 6.

A factor of safety (FoS) of 1.5 is recommended for calculations involving base friction, and a FoS of 2.0 is recommended for passive earth pressure calculations. Passive resistance may require lateral movement equal to three percent of the embedded depth of the structure to fully mobilize. If less displacement is desired, the structural designer can prorate the passive resistance for the tolerable displacement. The maximum passive pressure should be capped at the value obtained at a depth of 10 feet.

**Table 5: Earth Pressure Coefficients and Equivalent Fluid Pressures Behind Retaining Structures**

| Retained Material Description        | Earth Pressure Coefficients |         | Equivalent Fluid Pressure (psf/ft) |         |
|--------------------------------------|-----------------------------|---------|------------------------------------|---------|
|                                      | Active                      | At-Rest | Active                             | At-Rest |
| Native Silty / Gravely Sand, In-Situ | 0.36                        | 0.56    | 30                                 | 52      |
| Engineered Fill                      | 0.26                        | 0.44    | 33                                 | 55      |
| Structural Fill                      | 0.24                        | 0.41    | 30                                 | 52      |

**Table 6: Equivalent Passive Fluid Pressure and Base Friction Coefficients**

| Resisting Material Description       | Earth Pressure Coefficient | Equivalent Fluid Pressure (psf/ft) | Ultimate Base Friction Coefficient |
|--------------------------------------|----------------------------|------------------------------------|------------------------------------|
|                                      | Passive                    | Passive (No FoS)                   |                                    |
| Native Silty / Gravely Sand, In-Situ | 2.56                       | 281                                | 0.62                               |
| Engineered Fill                      | 3.54                       | 442                                | 0.67                               |
| Structural Fill                      | 3.85                       | 481                                | 0.73                               |

## 5.0 SITE GRADING AND EARTHWORK

All site preparation and earthwork operations should be performed in accordance with applicable codes. All references to maximum-dry density and optimum-moisture content are established in accordance with ASTM standard test method D1557 (Modified Proctor). General recommendations for site preparation after rough grading and engineered-fill placement are provided below.

### 5.1 Drainage

Infiltration of water into utility trenches or foundation excavations should be prevented during construction. Surface features which could retain water in the areas adjacent to the proposed building should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, WSP recommends that protective slopes be provided with a minimum grade of approximately 5 percent for at least 10 feet from the perimeter walls. Backfill against footings, exterior walls, and utility line trenches should be well compacted and free of all construction debris to reduce possibility of moisture infiltration.

### 5.2 Temporary Excavations

It is anticipated that shallow excavation within the study area can be accomplished with conventional earthmoving equipment. Instability in the form of caving, sloughing, and raveling should be expected in excavations which extend into granular deposits.

Safe, stable construction slopes are the responsibility of the contractor and depend on the ground and site conditions encountered at the time of construction. Excavations should be sloped or shored in the interest of safety following local regulations including current OSHA excavation and trenching safety standards.

### 5.3 Site Preparation Prior to Filling

Any obvious obstructions (e.g., boulders, existing pavements or debris from previous development) or exposed deleterious organic or inert materials should be removed from the base of the cuts that will receive new engineered fill.

Prior to placement of any engineered fill, the upper 8 inches of the exposed subgrade will be scarified, moisture conditioned and compacted to a minimum of 90 percent of the maximum density, as determined by the Modified Proctor (ASTM D1557) test, to provide a uniform bearing surface for construction of subsequent lifts of fill. This procedure will also serve to identify pockets of loose subgrade that could affect compaction of the initial lifts of engineered fill. Any loose pockets of subgrade that are detected should be removed to a depth until the base can sustain compaction of the upper 8 inches to 90 percent of the maximum density.

WSP should be notified immediately if the subsurface conditions exposed during grading operations vary from those described in this report, because revision of the recommendations contained herein may be necessary.

### 5.4 Engineered Fill

Based on our geotechnical investigation, the soils encountered on this site are likely to meet the requirements of engineered fill. All earthwork shall be in accordance with Sections 203 and 206 of the CDOT standard specifications. Structure backfill shall meet the requirements of Structure Backfill (Class 1) from the CDOT standard specifications. Engineered fill should be placed such that compacted lift thickness is equal to or less than 8 inches for rubber-tired or smooth drum roller type equipment and not exceeding 6 inches for sheep's foot rollers. The fill placed at foundation locations should be compacted to 92 percent of the maximum dry density as

determined by ASTM D1557 (Modified Proctor) at an as-compacted moisture content of within 2 percent of the optimum moisture content. Fill compaction placed at locations not supporting foundations may be compacted to 87 percent of maximum dry density as determined by ASTM D1557.

## 6.0 PAVEMENT RECOMMENDATIONS

We understand that as part of this project there will be paved roads and turn-arounds for buses. WSP has provided both flexible and rigid pavement sections, however, no traffic loading has been provided for the site. So we have back-calculated the ESAL values for several different pavement sections. Shrewsbury and RFTA will need to determine if these values are sufficient. We assume that all pavement mixes and placement procedures will follow relevant CDOT standards.

### 6.1 Design Parameters

WSP performed one R-Value test on material obtained from borehole BH3. The tested R-Value was 46. Published correlations with percent passing the #200 sieve and the plasticity index were evaluated against the index testing performed for the project. Nearly all of the correlated R-Values were higher than the tested value, so 46 was used for design. This resulted in a resilient modulus of approximately 15,000 psi.

We assume that the RFTA busses have an approximate gross (loaded) weight of 40,000 pounds, or about 2.22 18-kip single axle loadings.

### 6.2 Flexible Pavement Design

WSP selected several flexible pavement sections and reported the allowable 18-kip single axle loadings and the approximate equivalent number of bus loadings. The results are summarized below.

**Table 7: Flexible Pavement Options**

| Section Number | Thickness of AC (in) | Thickness of AB (in) | Allowable 18-kip Single Axle (ESAL) Loadings | Approximate Number of RFTA Bus Loadings |
|----------------|----------------------|----------------------|----------------------------------------------|-----------------------------------------|
| 1              | 6                    | 8                    | 4,000,000                                    | 1,800,000                               |
| 2              | 7                    | 10                   | 10,000,000                                   | 4,500,000                               |
| 3              | 7                    | 12                   | 15,000,000                                   | 6,750,000                               |

### 6.3 Rigid Pavement Design

Rigid pavement sections are recommended for most areas for this project. This type of pavement is better suited for bus turning movements. Plain jointed Portland Cement Concrete Pavement (PCCP) does not have any load transfer devices. Given the heavy bus volume and the potential for hydro-collapse settlement, WSP recommends that Jointed Reinforced (Doweled) PCCP be used to improve performance and reduce maintenance issues.

**Table 8: Rigid Pavement Options**

| Section Number | PCCP Type                   | Thickness (in) | Allowable 18-kip Single Axle (ESAL) Loadings | Approximate Number of RFTA Bus Loadings |
|----------------|-----------------------------|----------------|----------------------------------------------|-----------------------------------------|
| 1              | Plain Jointed (No Dowels)   | 10             | 3,000,000                                    | 1,351,000                               |
| 2              | Jointed Reinforced (Dowels) | 10             | 8,000,000                                    | 3,603,000                               |
| 3              | Jointed Reinforced (Dowels) | 11             | 15,000,000                                   | 6,750,000                               |
| 4              | Jointed Reinforced (Dowels) | 12             | 27,000,000                                   | 12,160,000                              |

## 6.4 Subgrade Preparation for Hydro-Compaction Mitigation

The pavement subgrade should be over-excavated to a depth of 3 feet below the top of subgrade wherever possible. The same material may be recompacted back into the excavation, but this will increase the density of the material and reduce the permeability which will help reduce the risk of hydro-collapse. The subgrade should be compacted to 92 percent of maximum density according to Modified Proctor (ASTM D1577), and within 2 percent wet of optimum moisture content.

## 7.0 SOIL CORROSIVITY

Laboratory tests for soil corrosion potential were performed on selected soil samples. A pH value of 8.3 was obtained from the laboratory testing. Generally, a pH between 6.5 and 7.5 is considered neutral with respect to corrosion, and the tested site soils fall just outside the neutral range on the basic side and should be considered mildly corrosive by this measure. Electrical resistivity values from 1,141 to 1,476 ohm-centimeters were obtained from laboratory testing.

On-site soils were also evaluated for soluble sulfate and chloride content to assess their corrosive potential with respect to sulfate attack. The average soluble sulfates and chloride contents measure in the lab were 9 parts per million (ppm) and 213 ppm, respectively. By this measure, the onsite soils are not corrosive, so no cement type restrictions are required.

## 8.0 LIMITATIONS

This report has been prepared exclusively for the use of Shrewsberry and Associates, LLC and RFTA. No other parties shall be entitled to rely on any of the information, conclusions, or opinions contained in this report without the prior written approval from Shrewsberry and WSP USA Inc.

This geotechnical report provides a compilation of the data collected during the geotechnical investigation that was completed for the project and provides recommendations to a level suitable to support the detailed design phase of the proposed project. Although no contaminated soils were observed and collected during the field investigation (based on field observations), this report does not take the place of a proper environmental



investigation that would be implemented to identify contaminants (should they exist) that may be encountered throughout the project site.

The conclusions and recommendations in this report have been prepared in a manner consistent with the level of care and skill ordinarily exercised by engineering professionals currently practicing under similar conditions, subject to the time limits and financial and physical constraints imposed on, or otherwise applicable, to WSP's analyses. The client has the responsibility to see that all parties to the project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. This report contains information that may be useful in the preparation of contract specifications and contractor cost estimates. However, this report is not written as a specification document and may not contain sufficient information for this use without proper modification.

## 9.0 REFERENCES

- ACI Committee 318. 2019. Building Code Requirements for Structural Concrete and Commentary, ACI-318-19, American Concrete Institute, Farmington Hills, MI.
- ASCE (American Society of Civil Engineer). 2022. (Reston, Virginia) (ed.). Minimum design loads and associated criteria for buildings and other structures: ASCE/SEI 7-22. Reston: American Society of Civil Engineers.
- Brown DA, Turner JP, and Castelli RJ. 2010. Drilled Shafts: Construction Procedures and LRFD Design Methods. Federal Highways Administration (FHWA) Technical Report No. FHWA-10-016, NHI Course No. 132014, Geotechnical Engineering Circular No. 10.
- Collier Geophysics. 2022. Geophysical Letter Report | Project # 22-007, RFTA Maintenance Facility Geophysical Investigation, Glenwood Springs, CO.
- Houston SL, Houston WN, and Lawrence CA. 2002. *Collapseable Soil Engineering in Highway Infrastructure Development*, Journal of Transportation Engineering, Vol. 128, No. 3, pp. 295-300.
- IBC (International Building Code). 2021. International Code Council, Inc. USA.
- MNDOT (Minnesota Department of Transportation). 2021. 'Geotechnical Engineering Manual'.

## Signature Page

**WSP USA Inc.**



Randy Post, PE  
*Assistant Vice President, Geotechnical Engineer*

A handwritten signature in blue ink, likely belonging to Roger Pihl.

Roger Pihl, PG  
*Vice President, Senior Geologist*

RMP/RAP/rm

[https://goldeassociates.sharepoint.com/sites/133686/project files/6 deliverables/reports/002-rpt-geotech\\_rfta\\_gmf\\_ph6\\_admin\\_bldg/rev0/20365011-002-rpt-0-rfta\\_phase6\\_geotech\\_report\\_25aug23.docx](https://goldeassociates.sharepoint.com/sites/133686/project%20files/6%20deliverables/reports/002-rpt-geotech_rfta_gmf_ph6_admin_bldg/rev0/20365011-002-rpt-0-rfta_phase6_geotech_report_25aug23.docx)

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**APPENDIX A**

# Borehole Logs

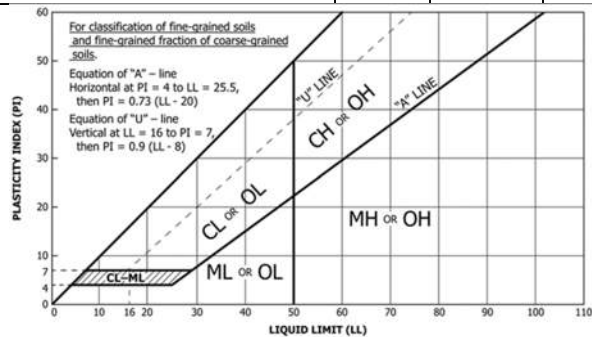
# METHOD OF SOIL CLASSIFICATION

The WSP Canada Soil Classification<sup>1</sup> System is based on the Unified Soil Classification System (USCS) (after ASTM D2487)

| Organic or Inorganic                                                                 | Soil Group                                                     | Type of Soil                                                        |                                                               | Gradation or Plasticity                                                                       | $Cu = \frac{D_{60}}{D_{10}}$                                                                                                                                                                                                          |                                                                                                                                                                    | $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ |                | Organic Content <sup>6,9</sup> | USCS Group Symbol <sup>3,5,7</sup> | Primary Group Name <sup>2</sup>     |                                 |                                |                                 |                            |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------|--------------------------------|------------------------------------|-------------------------------------|---------------------------------|--------------------------------|---------------------------------|----------------------------|
| INORGANIC<br>(Organic Content <30% by mass)                                          | COARSE-GRAINED SOILS<br>(>50% by mass is larger than 0.075 mm) | GRAVELS<br>(>50% by mass of coarse fraction is larger than 4.75 mm) | Clean Gravels with <5% fines <sup>3</sup> (by mass)           | Well Graded                                                                                   | ≥4                                                                                                                                                                                                                                    | (and)                                                                                                                                                              | ≥1 to ≤3                                       |                | ≤30%                           | GW                                 | Well-graded GRAVEL <sup>4,6</sup>   |                                 |                                |                                 |                            |
|                                                                                      |                                                                |                                                                     |                                                               | Poorly Graded                                                                                 | <4                                                                                                                                                                                                                                    | (and/or)                                                                                                                                                           | <1 or >3                                       |                |                                | GP                                 | Poorly graded GRAVEL <sup>4,6</sup> |                                 |                                |                                 |                            |
|                                                                                      |                                                                |                                                                     | Gravels with >12% fines <sup>3</sup> (by mass)                | Below A Line                                                                                  | n/a                                                                                                                                                                                                                                   |                                                                                                                                                                    |                                                |                |                                |                                    | GM                                  | SILTY GRAVEL <sup>4,6</sup>     |                                |                                 |                            |
|                                                                                      |                                                                |                                                                     |                                                               | Above A Line                                                                                  | n/a                                                                                                                                                                                                                                   |                                                                                                                                                                    |                                                |                |                                |                                    | GC                                  | CLAYEY GRAVEL <sup>4,5,6</sup>  |                                |                                 |                            |
|                                                                                      |                                                                | SANDS<br>(≥50% by mass of coarse fraction is smaller than 4.75 mm)  | Clean Sands with <5% fines <sup>7</sup> (by mass)             | Well Graded                                                                                   | ≥6                                                                                                                                                                                                                                    | (and)                                                                                                                                                              | ≥1 to ≤3                                       |                |                                | SW                                 | Well-graded SAND <sup>6,8</sup>     |                                 |                                |                                 |                            |
|                                                                                      |                                                                |                                                                     |                                                               | Poorly Graded                                                                                 | <6                                                                                                                                                                                                                                    | (and/or)                                                                                                                                                           | <1 or >3                                       |                |                                | SP                                 | Poorly graded SAND <sup>6,8</sup>   |                                 |                                |                                 |                            |
|                                                                                      |                                                                |                                                                     | Sands with >12% fines <sup>7</sup> (by mass)                  | Below A Line                                                                                  | n/a                                                                                                                                                                                                                                   |                                                                                                                                                                    |                                                |                |                                |                                    | SM                                  | SILTY SAND <sup>6,8</sup>       |                                |                                 |                            |
|                                                                                      |                                                                |                                                                     |                                                               | Above A Line                                                                                  | n/a                                                                                                                                                                                                                                   |                                                                                                                                                                    |                                                |                |                                |                                    | SC                                  | CLAYEY SAND <sup>5,6,8</sup>    |                                |                                 |                            |
|                                                                                      |                                                                |                                                                     | Organic or Inorganic                                          | Soil Group                                                                                    | Type of Soil                                                                                                                                                                                                                          | Laboratory Tests                                                                                                                                                   | Field Indicators                               |                |                                |                                    |                                     | Organic Content <sup>8,10</sup> | USCS Group Symbol <sup>A</sup> | Primary Group Name <sup>A</sup> |                            |
|                                                                                      |                                                                |                                                                     |                                                               |                                                                                               |                                                                                                                                                                                                                                       |                                                                                                                                                                    | Dilatancy                                      | Dry Strength   |                                | Shine Test                         | Thread Diameter (mm)                |                                 |                                |                                 | Toughness (of 3 mm thread) |
|                                                                                      |                                                                | INORGANIC<br>(Organic Content <30% by mass)                         | FINE-GRAINED SOILS<br>(≥50% by mass is smaller than 0.075 mm) | SILTS<br>(Nonplastic or PI and LL plot <u>below A-Line</u> on Plasticity Chart <sup>C</sup> ) | Liquid Limit                                                                                                                                                                                                                          | Rapid                                                                                                                                                              | None to Low                                    | Dull to None   |                                | 3 to >6                            | Low/can't roll 3 mm                 | <15%                            | ML                             | SILT <sup>H</sup>               |                            |
|                                                                                      |                                                                |                                                                     |                                                               |                                                                                               | <50 <sup>D</sup>                                                                                                                                                                                                                      | None to Slow                                                                                                                                                       | Low to Medium                                  | Dull to Slight |                                | 3 to 6                             | Low                                 | 15% to 30%                      | OL                             | ORGANIC SILT                    |                            |
| Liquid Limit                                                                         | None to V.Slow                                                 |                                                                     |                                                               |                                                                                               | Low to Medium                                                                                                                                                                                                                         | Slight                                                                                                                                                             | 3 to 6                                         | Low to Medium  | <15%                           | MH                                 | ELASTIC SILT <sup>H</sup>           |                                 |                                |                                 |                            |
| ≥50 <sup>D</sup>                                                                     | None                                                           |                                                                     |                                                               |                                                                                               | Medium to High                                                                                                                                                                                                                        | Dull to Slight                                                                                                                                                     | 1 to 3                                         | Low to Medium  | 15% to <30%                    | OH                                 | ORGANIC SILT                        |                                 |                                |                                 |                            |
| CLAYS<br>(PI and LL plot <u>above A-Line</u> on Plasticity Chart below) <sup>A</sup> | Liquid Limit                                                   |                                                                     |                                                               | None to Medium Slow                                                                           | Medium to High                                                                                                                                                                                                                        | Slight to Shiny                                                                                                                                                    | 1 to 3                                         | Medium         | <15%                           | CL                                 | LEAN CLAY <sup>A,E,F,G,H</sup>      |                                 |                                |                                 |                            |
|                                                                                      | <50 <sup>D</sup>                                               |                                                                     |                                                               | None to V.Slow                                                                                | Medium to High                                                                                                                                                                                                                        | Slight to Shiny                                                                                                                                                    | 1 to 3                                         | Medium         | 15% to <30%                    | OL                                 | ORGANIC CLAY <sup>E,F,G</sup>       |                                 |                                |                                 |                            |
|                                                                                      | Liquid Limit                                                   |                                                                     |                                                               | None                                                                                          | High to V.High                                                                                                                                                                                                                        | Shiny                                                                                                                                                              | <1                                             | High           | <15%                           | CH                                 | FAT CLAY <sup>E,F,G,H</sup>         |                                 |                                |                                 |                            |
|                                                                                      | ≥50 <sup>D</sup>                                               |                                                                     |                                                               | None                                                                                          | High                                                                                                                                                                                                                                  | Shiny                                                                                                                                                              | <1 to 1                                        | High           | 15% to <30%                    | OH                                 | ORGANIC CLAY <sup>E,F,G</sup>       |                                 |                                |                                 |                            |
|                                                                                      | HIGHLY ORGANIC SOILS<br>(Organic Content >30% by mass)         |                                                                     |                                                               | Peat and mineral soil mixtures                                                                | Relatively lightweight, possibly spongy. Some water may squeeze from sample. Some shrinkage may occur on air drying. Sand fraction may be visible. Low to high dilatancy. Thread weak near plastic limit. Low to medium dry strength. |                                                                                                                                                                    |                                                |                |                                |                                    | 30% to <75%                         | PT                              | SILTY PEAT, SANDY PEAT         |                                 |                            |
|                                                                                      |                                                                |                                                                     |                                                               |                                                                                               | Predominantly peat, may contain some mineral soil, fibrous or amorphous peat                                                                                                                                                          | Lightweight, spongy. Much water squeezes from sample. Shrinks considerably on air drying (i.e., very high water content). Plant structure identifiable to altered. |                                                |                |                                |                                    |                                     |                                 | 75% to 100%                    | PEAT                            |                            |

## Coarse-Grained Soil Note(s):

- Based on the material passing the 75 mm sieve.
- If field sample contains or drilling observations indicate cobbles or boulders or both, add, "with cobbles" or "with cobbles and boulders". Include notes on the depth(s) encountered, and sizes if possible.
- Gravels with 5% to 12% fines require dual symbols:  
(GW-GM) Well-graded GRAVEL with silt,  
(GW-GC) Well-graded GRAVEL with clay,  
(GP-GM) Poorly graded GRAVEL with silt,  
(GP-GC) Poorly graded GRAVEL with clay.
- If soil contains ≥15% sand, add "with sand" to Group Name.
- If fines classify as CL-ML, use dual symbol (GC-GM) or (SC-SM) for Group Symbol.
- If the soil has an organic content (OC) 15%≤OC<30% the prefix "Organic" should be added before the Group Name. If the soil has an organic content 3%≤OC<15% add "with organic fines" to Group Name. If the soil contains >0% to ≤3% organics, the descriptor "trace organics" may be added.
- Sands with 5% to 12% fines require dual symbols:  
(SW-SM) Well-graded SAND with silt,  
(SW-SC) Well-graded SAND with clay,  
(SP-SM) Poorly graded SAND with silt,  
(SP-SC) Poorly graded SAND with clay.
- If soil contains ≥15% gravel, add "with gravel" to Group Name.



## Fine-Grained Soil Note(s):

- If Atterberg limits plot above the A-line but in the 'hatched' area on the plasticity chart, soil is a (CL-ML) SILTY CLAY.
- If the soil contains >0% to ≤3% organics, the descriptor "trace organics" may be added.
- If fine-grained materials are nonplastic (i.e., a plastic limit (PL) cannot be measured), soil is a (ML) SILT.
- If soil has a liquid limit (LL) >30% to <50%, the term 'medium plasticity' may be included in the description, but the Group Name/Symbol is not changed.
- If soil contains 15% to <30% +No.200, add "with sand" or "with gravel".
- If soil contains ≥30% +No.200 mainly sand, add "Sandy" to Group Name.
- If soil contains ≥30% +No.200 mainly gravel, add "Gravelly" to Group Name.
- If the soil has an organic content (OC) 3%≤OC<15% add "with organic fines" to Group Name.

## ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

### PARTICLE SIZES OF CONSTITUENTS

| Soil Constituent | Particle Size Description | Millimetres                                     | Inches (US Std. Sieve Size)                  |
|------------------|---------------------------|-------------------------------------------------|----------------------------------------------|
| BOULDERS         | Not Applicable            | >300                                            | >12                                          |
| COBBLES          | Not Applicable            | 75 to 300                                       | 3 to 12                                      |
| GRAVEL           | Coarse<br>Fine            | 19 to 75<br>4.75 to 19                          | 0.75 to 3<br>(4) to 0.75                     |
| SAND             | Coarse<br>Medium<br>Fine  | 2.00 to 4.75<br>0.425 to 2.00<br>0.075 to 0.425 | (10) to (4)<br>(40) to (10)<br>(200) to (40) |
| SILT/CLAY        | Classified by plasticity  | <0.075                                          | < (200)                                      |

### GRADATIONAL COMPONENT TERMS

| % (by mass) | Term         |
|-------------|--------------|
| ≤ 5         | Use "trace"  |
| > 5 to ≤ 12 | Use "few"    |
| > 12 to <30 | Use "little" |
| ≥ 30 to <50 | Use "some"   |
| ≥ 50        | Use "mostly" |

### PENETRATION RESISTANCE

#### Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.). Values reported are as recorded in the field and are uncorrected.

#### Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm<sup>2</sup> pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance ( $q_t$ ), porewater pressure ( $u$ ) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

#### Dynamic Cone Penetration Resistance (DCPT); Nd:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

**PH:** Sampler advanced by hydraulic pressure

**PM:** Sampler advanced by manual pressure

**WH:** Sampler advanced by static weight of hammer

**WR:** Sampler advanced by weight of sampler and rod

### SAMPLES

|          |                                                                                      |
|----------|--------------------------------------------------------------------------------------|
| AS       | Auger sample                                                                         |
| BS       | Block sample                                                                         |
| CS       | Chunk sample                                                                         |
| DD       | Diamond Drilling                                                                     |
| DO or DP | Seamless open ended, driven, pushed tube sampler, or geoprobe macro-core – note size |
| DS       | Denison type sample                                                                  |
| FS       | Foil Sample                                                                          |
| GS       | Grab Sample                                                                          |
| MC       | Modified California Samples – note sample diameter and hammer weight                 |
| MS       | Modified Shelby (for frozen soil)                                                    |
| RC       | Rock core                                                                            |
| SC       | Soil core                                                                            |
| SS       | Split-spoon sampler (50 mm OD); larger sizes use MC                                  |
| ST       | Slotted tube                                                                         |
| TO       | Thin-walled, open – note size (Shelby tube)                                          |
| TP       | Thin-walled, piston – note size (Shelby tube)                                        |
| WS       | Wash sample                                                                          |

### SOIL TESTS

|                 |                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------|
| w               | water content                                                                                       |
| PL, $w_p$       | plastic limit                                                                                       |
| LL, $w_L$       | liquid limit                                                                                        |
| C               | consolidation (oedometer) test                                                                      |
| CHEM            | chemical analysis (refer to text)                                                                   |
| CID             | consolidated isotropically drained triaxial test <sup>1</sup>                                       |
| CIU             | consolidated isotropically undrained triaxial test with porewater pressure measurement <sup>1</sup> |
| D <sub>R</sub>  | relative density (specific gravity, G <sub>s</sub> )                                                |
| DS              | direct shear test                                                                                   |
| GS              | specific gravity                                                                                    |
| M               | sieve analysis for particle size                                                                    |
| MH              | combined sieve and hydrometer (H) analysis                                                          |
| MPC             | Modified Proctor compaction test                                                                    |
| SPC             | Standard Proctor compaction test                                                                    |
| OC              | organic content test                                                                                |
| SO <sub>4</sub> | concentration of water-soluble sulphates                                                            |
| UC              | unconfined compression test                                                                         |
| UU              | unconsolidated undrained triaxial test                                                              |
| V (FV)          | field vane (LV-laboratory vane test)                                                                |
| γ               | unit weight                                                                                         |

1. Tests anisotropically consolidated prior to shear are shown as CAD, CAU.

### NON-COHESIVE (COHESIONLESS) SOILS

#### Compactness<sup>2</sup>

| Term       | SPT 'N' (blows/0.3m) <sup>1</sup> |
|------------|-----------------------------------|
| Very Loose | 0 to 4                            |
| Loose      | 4 to 10                           |
| Compact    | 10 to 30                          |
| Dense      | 30 to 50                          |
| Very Dense | >50                               |

- SPT 'N' in general accordance with ASTM D1586, uncorrected for the effects of overburden pressure.
- Definition of compactness terms are based on SPT 'N' ranges as provided in Terzaghi, Peck and Mesri (1996). Many factors affect the recorded SPT 'N' value, including hammer efficiency (which may be greater than 60% in automatic trip hammers), overburden pressure, groundwater conditions, and grain size. As such, the recorded SPT 'N' value(s) should be considered only an approximate guide to the soil compactness. These factors need to be considered when evaluating the results, and the stated compactness terms should not be relied upon for design or construction.

#### Field Moisture Condition

| Term  | Description                                                   |
|-------|---------------------------------------------------------------|
| Dry   | Soil flows freely through fingers.                            |
| Moist | Soils are darker than in the dry condition and may feel cool. |
| Wet   | As moist, but with free water forming on hands when handled.  |

### COHESIVE SOILS

#### Consistency

| Term       | Undrained Shear Strength (kPa) | SPT 'N' <sup>1,2</sup> (blows/0.3m) |
|------------|--------------------------------|-------------------------------------|
| Very Soft  | <12                            | 0 to 2                              |
| Soft       | 12 to 25                       | 2 to 4                              |
| Firm       | 25 to 50                       | 4 to 8                              |
| Stiff      | 50 to 100                      | 8 to 15                             |
| Very Stiff | 100 to 200                     | 15 to 30                            |
| Hard       | >200                           | >30                                 |

- SPT 'N' in general accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.
- SPT 'N' values should be considered ONLY an approximate guide to consistency; for sensitive clays (e.g., Champlain Sea clays), the N-value approximation for consistency terms does NOT apply. Rely on direct measurement of undrained shear strength or other manual observations.

#### Water Content

| Term   | Description                                                |
|--------|------------------------------------------------------------|
| w < PL | Material is estimated to be drier than the Plastic Limit.  |
| w ~ PL | Material is estimated to be close to the Plastic Limit.    |
| w > PL | Material is estimated to be wetter than the Plastic Limit. |



## LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

### I. GENERAL

|             |                                       |
|-------------|---------------------------------------|
| $\pi$       | 3.1416                                |
| $\ln x$     | natural logarithm of x                |
| $\log_{10}$ | x or log x, logarithm of x to base 10 |
| g           | acceleration due to gravity           |
| t           | time                                  |

### II. STRESS AND STRAIN

|                                |                                                                            |
|--------------------------------|----------------------------------------------------------------------------|
| $\gamma$                       | shear strain                                                               |
| $\Delta$                       | change in, e.g. in stress: $\Delta \sigma$                                 |
| $\varepsilon$                  | linear strain                                                              |
| $\varepsilon_v$                | volumetric strain                                                          |
| $\eta$                         | coefficient of viscosity                                                   |
| $\nu$                          | Poisson's ratio                                                            |
| $\sigma$                       | total stress                                                               |
| $\sigma'$                      | effective stress ( $\sigma' = \sigma - u$ )                                |
| $\sigma'_{vo}$                 | initial effective overburden stress                                        |
| $\sigma_1, \sigma_2, \sigma_3$ | principal stress (major, intermediate, minor)                              |
| $\sigma_{oct}$                 | mean stress or octahedral stress<br>$= (\sigma_1 + \sigma_2 + \sigma_3)/3$ |
| $\tau$                         | shear stress                                                               |
| u                              | porewater pressure                                                         |
| E                              | modulus of deformation                                                     |
| G                              | shear modulus of deformation                                               |
| K                              | bulk modulus of compressibility                                            |

### III. SOIL PROPERTIES

#### (a) Index Properties

|                    |                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------|
| $\rho(\gamma)$     | bulk density (bulk unit weight)*                                                                     |
| $\rho_d(\gamma_d)$ | dry density (dry unit weight)                                                                        |
| $\rho_w(\gamma_w)$ | density (unit weight) of water                                                                       |
| $\rho_s(\gamma_s)$ | density (unit weight) of solid particles                                                             |
| $\gamma'$          | unit weight of submerged soil<br>( $\gamma' = \gamma - \gamma_w$ )                                   |
| $D_R$              | relative density (specific gravity) of solid particles ( $D_R = \rho_s / \rho_w$ ) (formerly $G_s$ ) |
| e                  | void ratio                                                                                           |
| n                  | porosity                                                                                             |
| S                  | degree of saturation                                                                                 |

#### (a) Index Properties (continued)

|             |                                                                                      |
|-------------|--------------------------------------------------------------------------------------|
| w           | water content                                                                        |
| $w_l$ or LL | liquid limit                                                                         |
| $w_p$ or PL | plastic limit                                                                        |
| $I_p$ or PI | plasticity index = $(w_l - w_p)$                                                     |
| NP          | nonplastic                                                                           |
| $w_s$       | shrinkage limit                                                                      |
| $I_L$       | liquidity index = $(w - w_p) / I_p$                                                  |
| $I_C$       | consistency index = $(w_l - w) / I_p$                                                |
| $e_{max}$   | void ratio in loosest state                                                          |
| $e_{min}$   | void ratio in densest state                                                          |
| $I_D$       | density index = $(e_{max} - e) / (e_{max} - e_{min})$<br>(formerly relative density) |

#### (b) Hydraulic Properties

|   |                                                         |
|---|---------------------------------------------------------|
| h | hydraulic head or potential                             |
| q | rate of flow                                            |
| v | velocity of flow                                        |
| i | hydraulic gradient                                      |
| k | hydraulic conductivity<br>(coefficient of permeability) |
| j | seepage force per unit volume                           |

#### (c) Consolidation (one-dimensional)

|             |                                                       |
|-------------|-------------------------------------------------------|
| $C_c$       | compression index<br>(normally consolidated range)    |
| $C_r$       | recompression index<br>(over-consolidated range)      |
| $C_s$       | swelling index                                        |
| $C_\alpha$  | secondary compression index                           |
| $m_v$       | coefficient of volume change                          |
| $C_v$       | coefficient of consolidation (vertical direction)     |
| $C_h$       | coefficient of consolidation (horizontal direction)   |
| $T_v$       | time factor (vertical direction)                      |
| U           | degree of consolidation                               |
| $\sigma'_p$ | pre-consolidation stress                              |
| OCR         | over-consolidation ratio = $\sigma'_p / \sigma'_{vo}$ |

#### (d) Shear Strength

|                  |                                                          |
|------------------|----------------------------------------------------------|
| $\tau_p, \tau_r$ | peak and residual shear strength                         |
| $\phi'$          | effective angle of internal friction                     |
| $\delta$         | angle of interface friction                              |
| $\mu$            | coefficient of friction = $\tan \delta$                  |
| $c'$             | effective cohesion                                       |
| $c_u, s_u$       | undrained shear strength ( $\phi = 0$ analysis)          |
| p                | mean total stress $(\sigma_1 + \sigma_3)/2$              |
| $p'$             | mean effective stress $(\sigma'_1 + \sigma'_3)/2$        |
| q                | $(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$ |
| $q_u$            | compressive strength $(\sigma_1 - \sigma_3)$             |
| $S_t$            | sensitivity                                              |

\* Density symbol is  $\rho$ . Unit weight symbol is  $\gamma$  where  $\gamma = \rho g$  (i.e. mass density multiplied by acceleration due to gravity)

Notes: 1  
2

$$\tau = c' + \sigma' \tan \phi'$$

$$\text{shear strength} = (\text{compressive strength})/2$$

# RECORD OF BOREHOLE: BH-1

Sheet 1 of 2

CLIENT: Shrewsbury & Associates DATE: May 02, 2023 ELEVATION: 5809.0 ft (Ground)  
 PROJECT: RFTA Geotechnical Investigation COORDINATES: Lat: 39.557560° Long: -107.353959°  
 PROJECT NO: 20365011 INCLINATION: 90.0° COORD SYS: Geographical Coordinates  
 LOCATION: Glenwood Springs, CO, USA CONTRACTOR: Dakota Drilling HORZ DATUM: NAD83 VERT DATUM: NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD | MATERIAL PROFILE                                                                                             |      |             |                  | SAMPLES |        |             |         |           | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS | ADDITIONAL OBSERVATIONS |  |
|------------|-----------|--------------|--------------------------------------------------------------------------------------------------------------|------|-------------|------------------|---------|--------|-------------|---------|-----------|------------------------|--------------------------|-------------------------|--|
|            |           |              | DESCRIPTION                                                                                                  | USCS | STRATA PLOT | ELEV. DEPTH (ft) | NUMBER  | TYPE   | REC % BLOWS | N-VALUE |           |                        |                          |                         |  |
|            |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 1          |           |              | ASPHALT. FILL.                                                                                               |      |             |                  | 0.0     |        |             |         |           |                        |                          |                         |  |
| 2          |           |              | (SM) Silty sand, some SAND, few gravel; brownish red.                                                        | SM   |             |                  | 5808.6  |        |             |         |           |                        |                          |                         |  |
| 3          |           |              |                                                                                                              |      |             |                  | 0.4     | SS1    | SS          | 42      | 14-50*    |                        |                          |                         |  |
| 4          |           |              | (SM) Silty sand, some SAND, few gravel; brownish red; dry to moist.                                          |      |             |                  | 5805.5  |        |             |         |           |                        |                          |                         |  |
| 5          |           |              |                                                                                                              |      |             |                  | 3.5     | SS2    | SS          | 67      | 8-6-7     | 13                     |                          |                         |  |
| 6          |           |              |                                                                                                              |      |             |                  | 5801.5  |        |             |         |           |                        |                          |                         |  |
| 7          |           |              | (SM) Silty sand, some SAND, some non plastic FINES, few gravel; brownish red; dry to moist.                  | GM   |             |                  | 7.5     |        |             |         |           |                        |                          |                         |  |
| 8          |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 9          |           |              |                                                                                                              |      |             |                  |         | SS3    | SS          | 90      | 14-15-20  | 35                     |                          |                         |  |
| 10         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 11         |           |              |                                                                                                              |      |             |                  |         | 5796.5 |             |         |           |                        |                          |                         |  |
| 12         |           |              |                                                                                                              |      | 12.5        |                  |         |        |             |         |           |                        |                          |                         |  |
| 13         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; red; dry to moist.                                    | SM   |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 14         |           |              |                                                                                                              |      |             |                  |         | SS4    | SS          | 76      | 15-20-50* |                        |                          |                         |  |
| 15         |           |              |                                                                                                              |      |             |                  |         | 5791.5 |             |         |           |                        |                          |                         |  |
| 16         |           |              |                                                                                                              |      |             |                  |         | 17.5   | MC1         | MC2     | 17-19     | 36                     |                          |                         |  |
| 17         |           |              | (GM) Silty gravel with sand, some gravel, some sand; brownish red; dry to moist.                             |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 18         |           |              |                                                                                                              |      |             |                  | 5786.5  |        |             |         |           |                        |                          |                         |  |
| 19         |           |              | (SM) Silty sand with gravel, some SAND, some gravel, some non plastic fines; brownish red; moist.            | SM   |             |                  | 22.5    |        |             |         |           |                        |                          |                         |  |
| 20         |           |              |                                                                                                              |      |             |                  |         | SS6    | SS          | 57      | 12-11-18  | 29                     |                          |                         |  |
| 21         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 22         |           |              |                                                                                                              |      |             |                  |         | 5779.0 |             |         |           |                        |                          |                         |  |
| 23         |           |              | (SM) Silty sand with gravel, some SAND, little gravel, little non plastic fines; brownish red; dry to moist. |      |             |                  | 30.0    | SS7    | SS          | 20      | 50*       |                        |                          |                         |  |
| 24         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 25         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 26         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 27         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 28         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 29         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 30         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 31         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 32         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 33         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 34         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 35         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 36         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 37         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 38         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; brownish red; dry to moist.                           | SM   |             |                  | 5771.5  |        |             |         |           |                        |                          |                         |  |
| 39         |           |              |                                                                                                              |      |             |                  | 37.5    |        |             |         |           |                        |                          |                         |  |
| 40         |           |              |                                                                                                              |      |             |                  |         | MC2    | MC2         |         |           |                        |                          |                         |  |
| 41         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 42         |           |              |                                                                                                              |      |             |                  |         | 5766.5 |             |         |           |                        |                          |                         |  |
| 43         |           |              | (SM) Silty sand, mostly SAND, few gravel; red; moist.                                                        |      |             |                  | 42.5    |        |             |         |           |                        |                          |                         |  |
| 44         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 45         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 46         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 47         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |
| 48         |           |              | (SM) Silty sand, some SAND, some non plastic FINES, few gravel; red; moist.                                  | SM   |             |                  | 5761.5  |        |             |         |           |                        |                          |                         |  |
| 49         |           |              |                                                                                                              |      |             |                  | 47.5    |        |             |         |           |                        |                          |                         |  |
| 50         |           |              |                                                                                                              |      |             |                  |         |        |             |         |           |                        |                          |                         |  |

Continued on Next Page

Continued on Next Page

HAMMER TYPE: Manual-Safety



REV:

Rev 0

LOGGED: Cody Stopka

CHECKED: Randy Post

DATE: May 02, 2023

DATE: Jul 13, 2023

Golden Log Imperial / Soil-General 6 / Golden - 3 Imperial US / ASTM D2487 Auto (most common ASTM) / 2023-08-26

RECORD OF BOREHOLE: BH-1

Sheet 2 of 2

CLIENT: Shrewsberry & Associates

PROJECT: RFTA Geotechnical Investigation

PROJECT NO: 20365011

LOCATION: Glenwood Springs, CO, USA

DATE: May 02, 2023

INCLINATION: 90.0°

CONTRACTOR: Dakota Drilling

ELEVATION: 5809.0 ft (Ground)

COORDINATES: Lat: 39.557560° Long: -107.353959°

COORD SYS: Geographical Coordinates

HORZ DATUM: NAD83 VERT DATUM: NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD | MATERIAL PROFILE                                                                    |      |             |                  | SAMPLES |                |             |         | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS | ADDITIONAL OBSERVATIONS                                 |  |                                                         |
|------------|-----------|--------------|-------------------------------------------------------------------------------------|------|-------------|------------------|---------|----------------|-------------|---------|------------------------|--------------------------|---------------------------------------------------------|--|---------------------------------------------------------|
|            |           |              | DESCRIPTION                                                                         | USCS | STRATA PLOT | ELEV. DEPTH (ft) | NUMBER  | TYPE           | REC % BLOWS | N-VALUE |                        |                          |                                                         |  |                                                         |
|            |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 51         |           |              | (SM) Silty sand, some SAND, some non plastic FINES, few gravel; red; moist.         | SM   |             | 5749.0<br>60.0   | SS10    | SS             | 100         | 32      |                        |                          | 55.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |  |                                                         |
| 52         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 53         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 54         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 55         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 56         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 57         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 58         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 59         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 60         |           |              | (GM) Silty gravel with sand, some GRAVEL, some SAND, little non plastic fines; red. | GM   |             | 5749.0<br>60.0   | MC3     | MC2            | 90          | 50      |                        |                          | 60.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |  |                                                         |
| 61         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 62         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 63         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 64         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 65         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 66         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 67         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 68         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 69         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 70         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 71         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 72         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 73         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 74         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 75         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 76         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 77         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 78         |           |              | (GM) Silty gravel with sand, some GRAVEL, some SAND; red; dry to moist.             |      |             |                  |         | 5731.5<br>77.5 |             |         |                        |                          |                                                         |  | 75.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |
| 79         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 80         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 81         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 82         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 83         |           |              | End of hole at 85.42 ft.                                                            |      |             | 5723.6           | SS12    | SS             | 38          | 5015"   |                        |                          | 80.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |  |                                                         |
| 84         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 85         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 86         |           |              | End of hole at 85.42 ft.                                                            |      |             | 5723.6           |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 87         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 88         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 89         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 90         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 91         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 92         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 93         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 94         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 95         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 96         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 97         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 98         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 99         |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |
| 100        |           |              |                                                                                     |      |             |                  |         |                |             |         |                        |                          |                                                         |  |                                                         |

HAMMER TYPE: Manual-Safety



REV:  
Rev 0

LOGGED: Cody Stopka  
CHECKED: Randy Post

DATE: May 02, 2023  
DATE: Jul 13, 2023

# RECORD OF BOREHOLE: BH-2

Sheet 1 of 2

CLIENT: Shrewsbury & Associates DATE: May 04, 2023 ELEVATION: 5801.0 ft (Ground)  
 PROJECT: RFTA Geotechnical Investigation COORDINATES: Lat: 39.557700° Long: -107.354609°  
 PROJECT NO: 20365011 INCLINATION: 90.0° COORD SYS: Geographical Coordinates  
 LOCATION: Glenwood Springs, CO, USA CONTRACTOR: Dakota Drilling HORZ DATUM: NAD83 VERT DATUM: NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD | MATERIAL PROFILE                                                                         |        |             |                  | SAMPLES |          |       |       |          | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS                                | ADDITIONAL OBSERVATIONS |  |  |
|------------|-----------|--------------|------------------------------------------------------------------------------------------|--------|-------------|------------------|---------|----------|-------|-------|----------|------------------------|---------------------------------------------------------|-------------------------|--|--|
|            |           |              | DESCRIPTION                                                                              | USCS   | STRATA PLOT | ELEV. DEPTH (ft) | NUMBER  | TYPE     | REC % | BLOWS | N-VALUE  |                        |                                                         |                         |  |  |
|            |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 1          |           |              | ASPHALT. FILL.                                                                           | SM     |             |                  | 0.0     |          |       |       |          |                        |                                                         |                         |  |  |
| 2          |           |              | (SM) Silty sand with gravel, mostly SAND, little gravel; brownish red; moist.            |        |             |                  | 5800.6  |          |       |       |          |                        |                                                         |                         |  |  |
| 3          |           |              |                                                                                          |        |             |                  | 0.4     |          |       |       |          |                        |                                                         |                         |  |  |
| 4          |           |              | (SM) Silty sand with gravel, some SAND, little gravel; red; moist.                       |        |             |                  | 5800.1  | SS1      | SS    | 63    | 8-12-7   | 19                     |                                                         |                         |  |  |
| 5          |           |              |                                                                                          |        |             |                  | 0.9     |          |       |       |          |                        |                                                         |                         |  |  |
| 6          |           |              |                                                                                          |        |             |                  | 5797.5  |          |       |       |          |                        |                                                         |                         |  |  |
| 7          |           |              |                                                                                          |        |             |                  | 3.5     | SS2      | SS    | 63    | 5-6-11   | 17                     |                                                         |                         |  |  |
| 8          |           |              | (SM) Silty sand with gravel, some sand, some gravel; brownish red; moist.                |        |             |                  | 5793.5  |          |       |       |          |                        |                                                         |                         |  |  |
| 9          |           |              |                                                                                          |        |             |                  | 7.5     |          |       |       |          |                        |                                                         |                         |  |  |
| 10         |           |              |                                                                                          |        |             |                  |         | SS3      | SS    | 67    | 21-50-2" |                        |                                                         |                         |  |  |
| 11         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 12         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 13         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 14         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 15         |           |              | (SM) Silty sand with gravel, some SAND, some non plastic fines, some gravel; red; moist. |        |             |                  | 5786.0  |          |       |       |          |                        |                                                         |                         |  |  |
| 16         |           |              |                                                                                          |        |             |                  | 15.0    |          |       |       |          |                        |                                                         |                         |  |  |
| 17         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 18         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 19         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 20         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 21         |           |              |                                                                                          |        |             |                  |         | MC1      | MC2   |       | 11-11    | 22                     |                                                         |                         |  |  |
| 22         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 23         |           |              | (SM) Silty sand with gravel, some SAND, some gravel, little non plastic fines; red.      |        |             |                  | 5778.5  |          |       |       |          |                        |                                                         |                         |  |  |
| 24         |           |              |                                                                                          |        |             |                  | 22.5    |          |       |       |          |                        |                                                         |                         |  |  |
| 25         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 26         |           |              |                                                                                          |        | SS4         | SS               | 67      | 25-20-14 | 34    |       |          |                        |                                                         |                         |  |  |
| 27         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 28         |           |              | (SM) Silty sand with gravel, some SAND, some non plastic FINES, little gravel; red.      | 5773.5 |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 29         |           |              |                                                                                          | 27.5   |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 30         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 31         |           |              |                                                                                          |        | SS5         | SS               | 87      | 10-8-14  | 22    |       |          |                        |                                                         |                         |  |  |
| 32         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 33         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 34         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 35         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; brownish red; moist.              | 5766.0 |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 36         |           |              |                                                                                          | 35.0   |             |                  |         |          |       |       |          |                        | 35.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |                         |  |  |
| 37         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 38         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 39         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 40         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 41         |           |              |                                                                                          |        | MC2         | MC2              |         | 50       |       |       |          |                        | 40.00 ft: Failed MC sample, unconsolidated.             |                         |  |  |
| 42         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 43         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; red; dry.                         | 5758.5 |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 44         |           |              |                                                                                          | 42.5   |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 45         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 46         |           |              |                                                                                          |        | SS6         | SS               | 17      | 7-10-6   | 16    |       |          |                        |                                                         |                         |  |  |
| 47         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 48         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 49         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |
| 50         |           |              |                                                                                          |        |             |                  |         |          |       |       |          |                        |                                                         |                         |  |  |

Continued on Next Page

Continued on Next Page

HAMMER TYPE: Manual-Safety



REV:

Rev 0

LOGGED: Cody Stopka

DATE: May 04, 2023

CHECKED: Randy Post

DATE: Jul 13, 2023

Golden Log Imperial / Soil-General 6 / Golden - 3 Imperial US / ASTM D2487 Auto (most common ASTM) / 2023-08-26

RECORD OF BOREHOLE: BH-2

Sheet 2 of 2

CLIENT:Shrewsberry & Associates

PROJECT:RFTA Geotechnical Investigation

PROJECT NO:20365011

LOCATION:Glenwood Springs, CO, USA

DATE:May 04, 2023

INCLINATION:90.0°

CONTRACTOR:Dakota Drilling

ELEVATION:5801.0 ft (Ground)

COORDINATES:Lat: 39.557700° Long: -107.354609°

COORD SYS:Geographical Coordinates

HORZ DATUM:NAD83 VERT DATUM:NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD | MATERIAL PROFILE                                                                         |      |             |                           | SAMPLES        |                |       |       |          | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS | ADDITIONAL OBSERVATIONS                                                  |                                                                          |
|------------|-----------|--------------|------------------------------------------------------------------------------------------|------|-------------|---------------------------|----------------|----------------|-------|-------|----------|------------------------|--------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------|
|            |           |              | DESCRIPTION                                                                              | USCS | STRATA PLOT | ELEV. -----<br>DEPTH (ft) | NUMBER         | TYPE           | REC % | BLOWS | N-VALUE  |                        |                          |                                                                          |                                                                          |
|            |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 51         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; red; dry.                         | SM   |             |                           |                |                |       |       |          |                        |                          | 50.00 ft: Driller notes sampler bouncing off rocks. No sample collected. |                                                                          |
| 52         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 53         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 54         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 55         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; brownish red; dry.                |      |             |                           |                | 5746.0<br>55.0 |       |       |          |                        |                          |                                                                          | 55.00 ft: Driller notes sampler bouncing off rocks. No sample collected. |
| 56         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 57         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 58         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 59         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 60         |           |              |                                                                                          |      |             |                           |                |                | MC3   | MC2   |          | 50                     |                          |                                                                          | 60.00 ft: Failed MC sample, unconsolidated.                              |
| 61         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 62         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 63         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 64         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 65         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 66         |           |              |                                                                                          |      |             |                           |                |                | SS7   | SS    | 60       | 28-50.4"               |                          |                                                                          |                                                                          |
| 67         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 68         |           |              | (SM) Silty sand with gravel, some SAND, some gravel, some non plastic fines; red; moist. |      |             |                           |                | 5733.5<br>67.5 |       |       |          |                        |                          |                                                                          |                                                                          |
| 69         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 70         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 71         |           |              |                                                                                          |      |             |                           |                | SS8            | SS    | 60    | 28-14-12 | 26                     |                          |                                                                          |                                                                          |
| 72         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 73         |           |              | (SM) Silty sand with gravel, some SAND, some gravel; red; moist.                         |      |             |                           | 5728.5<br>72.5 |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 74         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 75         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 76         |           |              |                                                                                          |      |             |                           |                | SS9            | SS    | 67    | 17-24-14 | 38                     |                          |                                                                          |                                                                          |
| 77         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 78         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 79         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 80         |           |              | (SM) Silty sand with gravel, some sand, some gravel, some non plastic fines; red; moist. |      |             |                           | 5721.0<br>80.0 |                |       |       |          |                        |                          | 80.00 ft: Driller notes sampler bouncing off rocks. No sample collected. |                                                                          |
| 81         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 82         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 83         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 84         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 85         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 86         |           |              |                                                                                          |      |             |                           | 5714.5         | SS10           | SS    | 80    | 15-32-45 | 77                     |                          |                                                                          |                                                                          |
| 87         |           |              | End of hole at 86.50 ft.                                                                 |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 88         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 89         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 90         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 91         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 92         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 93         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 94         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 95         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 96         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 97         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 98         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 99         |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |
| 100        |           |              |                                                                                          |      |             |                           |                |                |       |       |          |                        |                          |                                                                          |                                                                          |

HAMMER TYPE: Manual-Safety



REV:  
Rev 0

LOGGED: Cody Stopka  
CHECKED: Randy Post

DATE: May 04, 2023  
DATE: Jul 13, 2023

RECORD OF BOREHOLE: BH-3

Sheet 1 of 1

CLIENT: Shrewsberry & Associates

PROJECT: RFTA Geotechnical Investigation

PROJECT NO: 20365011

LOCATION: Glenwood Springs, CO, USA

DATE: May 01, 2023

INCLINATION: 90.0°

CONTRACTOR: Dakota Drilling

ELEVATION: 5802.0 ft (Ground)

COORDINATES: Lat: 39.557472° Long: -107.354639°

COORD SYS: Geographical Coordinates

HORZ DATUM: NAD83 VERT DATUM: NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD      | MATERIAL PROFILE                                                                                           |      |             |                  | SAMPLES |      |       |       | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS | ADDITIONAL OBSERVATIONS |         |
|------------|-----------|-------------------|------------------------------------------------------------------------------------------------------------|------|-------------|------------------|---------|------|-------|-------|------------------------|--------------------------|-------------------------|---------|
|            |           |                   | DESCRIPTION                                                                                                | USCS | STRATA PLOT | ELEV. DEPTH (ft) | NUMBER  | TYPE | REC % | BLOWS |                        |                          |                         | N-VALUE |
|            |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 1          |           | Hollow Stem Auger | ASPHALT. FILL.                                                                                             | GM   |             | 0.0              |         |      |       |       |                        |                          |                         |         |
| 2          |           |                   | (GM) Silty gravel with sand, some GRAVEL, some sand; brownish red; dry to moist.                           |      |             | 5801.6           |         |      |       |       |                        |                          |                         |         |
| 3          |           |                   |                                                                                                            |      |             | 0.4              |         |      |       |       |                        |                          |                         |         |
| 4          |           |                   |                                                                                                            |      |             | 5801.1           |         |      |       |       |                        |                          |                         |         |
| 5          |           |                   | (GM) Silty gravel with sand, some GRAVEL, some sand, little non plastic fines; brownish red; dry to moist. |      |             | 5798.5           |         |      |       |       |                        |                          |                         |         |
| 6          |           |                   | End of hole at 5.83 ft.                                                                                    |      |             | 3.5              |         |      |       |       |                        |                          |                         |         |
| 7          |           |                   |                                                                                                            |      |             | 5796.2           |         |      |       |       |                        |                          |                         |         |
| 8          |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 9          |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 10         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 11         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 12         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 13         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 14         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 15         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 16         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 17         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 18         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 19         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 20         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 21         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 22         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 23         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 24         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 25         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 26         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 27         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 28         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 29         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 30         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 31         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 32         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 33         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 34         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 35         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 36         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 37         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 38         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 39         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 40         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 41         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 42         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 43         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 44         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 45         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 46         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 47         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 48         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 49         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |
| 50         |           |                   |                                                                                                            |      |             |                  |         |      |       |       |                        |                          |                         |         |

Goldner Log Imperial / Soil-General 6 / Goldner - 3 Imperial US / ASTM D2487 Auto (most common ASTM) / 2023-08-26



# RECORD OF BOREHOLE: BH-4

Sheet 1 of 2

CLIENT: Shrewsberry & Associates      DATE: May 03, 2023      ELEVATION: 5786.0 ft (Ground)  
 PROJECT: RFTA Geotechnical Investigation      COORDINATES: Lat: 39.558321° Long: -107.354278°  
 PROJECT NO: 20365011      INCLINATION: 90.0°      COORD SYS: Geographical Coordinates  
 LOCATION: Glenwood Springs, CO, USA      CONTRACTOR: Dakota Drilling      HORZ DATUM: NAD83      VERT DATUM: NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD | MATERIAL PROFILE                                                                                               |       |             |                  | SAMPLES |        |       |          |         | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS | ADDITIONAL OBSERVATIONS                                 |  |                                 |  |
|------------|-----------|--------------|----------------------------------------------------------------------------------------------------------------|-------|-------------|------------------|---------|--------|-------|----------|---------|------------------------|--------------------------|---------------------------------------------------------|--|---------------------------------|--|
|            |           |              | DESCRIPTION                                                                                                    | USCS  | STRATA PLOT | ELEV. DEPTH (ft) | NUMBER  | TYPE   | REC % | BLOWS    | N-VALUE |                        |                          |                                                         |  |                                 |  |
|            |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 1          |           |              | MIXTURE of SOIL and ROCK.                                                                                      |       |             | 0.0              |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 2          |           |              | (SM) Silty sand with gravel, some SAND, little gravel; brownish red; moist.                                    | SM    |             | 5785.0           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 3          |           |              |                                                                                                                |       |             | 1.0              |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 4          |           |              | (SM) Silty sand with gravel, some sand, some gravel; brownish red; moist.                                      |       |             | 5782.5           | SS1     | SS     | 80    | 20-30-40 | 70      |                        |                          |                                                         |  |                                 |  |
| 5          |           |              |                                                                                                                |       |             | 3.5              |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 6          |           |              |                                                                                                                |       |             | 5778.5           | SS2     | SS     | 60    | 23-50-3* |         |                        |                          |                                                         |  |                                 |  |
| 7          |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 8          |           |              | (SM) Silty sand with gravel, some SAND, little gravel; brownish red; moist.                                    |       |             | 5778.5           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 9          |           |              |                                                                                                                |       |             | 7.5              |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 10         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 11         |           |              |                                                                                                                |       |             |                  | SS3     | SS     | 100   | 16-16-26 | 42      |                        |                          |                                                         |  |                                 |  |
| 12         |           |              |                                                                                                                |       |             | 5773.5           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 13         |           |              | (SC-SM) Silty, clayey sand with gravel, some SAND, some non plastic FINES, little gravel; brownish red; moist. | SC-SM |             | 12.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 14         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 15         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 16         |           |              |                                                                                                                |       |             |                  |         |        | SS4   | SS       | 73      | 14-7-7                 | 14                       |                                                         |  | 15.00 ft: Strong organic smell. |  |
| 17         |           |              |                                                                                                                |       |             |                  |         | 5768.5 |       |          |         |                        |                          |                                                         |  |                                 |  |
| 18         |           |              | (SC-SM) Silty, clayey sand with gravel, some SAND, little gravel; brownish red; moist.                         |       |             | 17.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 19         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 20         |           |              |                                                                                                                |       |             |                  | MC1     | MC2    |       | 50       |         |                        |                          |                                                         |  |                                 |  |
| 21         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 22         |           |              |                                                                                                                |       |             | 5763.5           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 23         |           |              | (SM) Silty sand with gravel, some SAND, some non plastic fines, little gravel; red; moist.                     | SM    |             | 22.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 24         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 25         |           |              |                                                                                                                |       |             |                  |         |        | SS5   | SS       | 73      | 10-25-21               | 46                       |                                                         |  |                                 |  |
| 26         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 27         |           |              |                                                                                                                |       |             |                  |         | 5758.5 |       |          |         |                        |                          |                                                         |  |                                 |  |
| 28         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; brownish red; moist.                                    |       |             | 27.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 29         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 30         |           |              |                                                                                                                |       |             |                  | SS6     | SS     | 23    | 27-16-12 | 28      |                        |                          | 30.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |  |                                 |  |
| 31         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 32         |           |              |                                                                                                                |       |             | 5753.5           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 33         |           |              | (SM) Silty sand with gravel, some SAND, some non plastic fines, little gravel; brownish red; moist.            |       |             | 32.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 34         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 35         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 36         |           |              |                                                                                                                |       |             |                  | SS7     | SS     | 67    | 9-9-11   | 20      |                        |                          |                                                         |  |                                 |  |
| 37         |           |              |                                                                                                                |       |             | 5748.5           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 38         |           |              | (SM) Silty sand with gravel, some SAND, some non plastic FINES, little gravel; red; moist.                     |       |             | 37.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 39         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 40         |           |              |                                                                                                                |       |             |                  | MC2     | MC2    |       | 12-20    | 32      |                        |                          |                                                         |  |                                 |  |
| 41         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 42         |           |              |                                                                                                                |       |             | 5743.5           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 43         |           |              | (SM) Silty sand with gravel, some SAND, little gravel; brownish red; dry to moist.                             |       |             | 42.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 44         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 45         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 46         |           |              |                                                                                                                |       |             |                  | SS8     | SS     | 67    | 17-11-11 | 22      |                        |                          |                                                         |  |                                 |  |
| 47         |           |              |                                                                                                                |       |             | 5738.5           |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 48         |           |              | (SM) Silty sand, mostly SAND, some non plastic FINES, few gravel; brownish red; moist.                         |       |             | 47.5             |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 49         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |
| 50         |           |              |                                                                                                                |       |             |                  |         |        |       |          |         |                        |                          |                                                         |  |                                 |  |

Continued on Next Page

Continued on Next Page

HAMMER TYPE: Manual-Safety



LOGGED: Cody Stopka  
 CHECKED: Randy Post

DATE: May 03, 2023  
 DATE: Jul 13, 2023

REV:  
 Rev 0

RECORD OF BOREHOLE: BH-4

Sheet 2 of 2

CLIENT: Shrewsberry & Associates

PROJECT: RFTA Geotechnical Investigation

PROJECT NO: 20365011

LOCATION: Glenwood Springs, CO, USA

DATE: May 03, 2023

INCLINATION: 90.0°

CONTRACTOR: Dakota Drilling

ELEVATION: 5786.0 ft (Ground)

COORDINATES: Lat: 39.558321° Long: -107.354278°

COORD SYS: Geographical Coordinates

HORZ DATUM: NAD83 VERT DATUM: NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD | MATERIAL PROFILE                                                                                           |      |             |                  | SAMPLES |      |             |         | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS | ADDITIONAL OBSERVATIONS |    |  |                                                         |  |
|------------|-----------|--------------|------------------------------------------------------------------------------------------------------------|------|-------------|------------------|---------|------|-------------|---------|------------------------|--------------------------|-------------------------|----|--|---------------------------------------------------------|--|
|            |           |              | DESCRIPTION                                                                                                | USCS | STRATA PLOT | ELEV. DEPTH (ft) | NUMBER  | TYPE | REC % BLOWS | N-VALUE |                        |                          |                         |    |  |                                                         |  |
|            |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 51         |           |              | (SM) Silty sand, mostly SAND, some non plastic FINES, few gravel; brownish red; moist.                     | SM   |             |                  |         |      | SS9         | SS      | 73                     | 12-10-9                  | 19                      |    |  |                                                         |  |
| 52         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 53         |           |              | (SM) Silty sand, some SAND, few gravel; red; dry to moist.                                                 |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 54         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 55         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 56         |           |              |                                                                                                            |      |             |                  |         |      |             | SS10    | SS                     | 43                       | 12-15-14                | 29 |  |                                                         |  |
| 57         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 58         |           |              | (SM) Silty sand, some SAND, some non plastic FINES, few gravel; red; dry to moist.                         |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 59         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 60         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 61         |           |              |                                                                                                            |      |             |                  |         |      |             | MC3     | MC2                    |                          | 12-17                   | 29 |  |                                                         |  |
| 62         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 63         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 64         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 65         |           |              | (SM) Silty sand with gravel, some SAND, some non plastic FINES, little gravel; brownish red; dry to moist. |      |             |                  |         |      | 5721.0      |         |                        |                          |                         |    |  | 65.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |  |
| 66         |           |              |                                                                                                            |      |             |                  |         |      | 65.0        |         |                        |                          |                         |    |  |                                                         |  |
| 67         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 68         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 69         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 70         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 71         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 72         |           |              |                                                                                                            |      |             |                  |         |      | SS11        | SS      | 43                     | 8-50-5*                  |                         |    |  |                                                         |  |
| 73         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 74         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 75         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  | 75.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |  |
| 76         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 77         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 78         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 79         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 80         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  | 80.00 ft: Rough drilling. Driller notes 1-2 ft boulder. |  |
| 81         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 82         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 83         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 84         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 85         |           |              |                                                                                                            |      |             |                  |         |      | 5701.0      |         |                        |                          |                         |    |  | 85.00 ft: Failed MC sample, no sample return.           |  |
| 86         |           |              | End of hole at 85.00 ft.                                                                                   |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 87         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 88         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 89         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 90         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 91         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 92         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 93         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 94         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 95         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 96         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 97         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 98         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 99         |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |
| 100        |           |              |                                                                                                            |      |             |                  |         |      |             |         |                        |                          |                         |    |  |                                                         |  |

HAMMER TYPE: Manual-Safety



REV:  
Rev 0

LOGGED: Cody Stopka  
CHECKED: Randy Post

DATE: May 03, 2023  
DATE: Jul 13, 2023

RECORD OF BOREHOLE: BH-5

Sheet 1 of 1

CLIENT: Shrewsberry & Associates

PROJECT: RFTA Geotechnical Investigation

PROJECT NO: 20365011

LOCATION: Greenwood Springs, CO, USA

DATE: May 01, 2023

INCLINATION: 90.0°

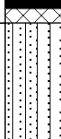
CONTRACTOR: Dakota Drilling

ELEVATION: 5810.0 ft (Ground)

COORDINATES: Lat: 39.557354° Long: -107.354186°

COORD SYS: Geographical Coordinates

HORZ DATUM: NAD83 VERT DATUM: NAVD88

| DEPTH (ft) | DRILL RIG | DRILL METHOD      | MATERIAL PROFILE                                                                                                                                                         |      |                                                                                   |                  | SAMPLES |      |       |       | SHEAR STRENGTH |                |   |   |   | ADDITIONAL LAB TESTING | GROUNDWATER OBSERVATIONS | ADDITIONAL OBSERVATIONS |   |  |  |
|------------|-----------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|------------------|---------|------|-------|-------|----------------|----------------|---|---|---|------------------------|--------------------------|-------------------------|---|--|--|
|            |           |                   | DESCRIPTION                                                                                                                                                              | USCS | STRATA PLOT                                                                       | ELEV. DEPTH (ft) | NUMBER  | TYPE | REC % | BLOWS | N-VALUE        | SHEAR STRENGTH |   |   |   |                        |                          |                         |   |  |  |
|            |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                | 1              | 2 | 3 | 4 |                        |                          |                         | 5 |  |  |
| 1          |           | Hollow Stem Auger | ASPHALT. FILL.<br>(SM) Silty sand with gravel, some SAND, little gravel; red.<br><br>(SM) Silty sand with gravel, some SAND, some non plastic FINES, little gravel; red. | SM   |  | 0.0              |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 2          | 5809.6    |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 3          | 0.4       |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 4          | 5809.1    |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 5          | 0.9       |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 6          |           |                   |                                                                                                                                                                          |      |                                                                                   | 5806.5           |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
|            |           |                   |                                                                                                                                                                          |      |                                                                                   | 3.5              |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 7          |           |                   | End of hole at 6.50 ft.                                                                                                                                                  |      |                                                                                   |                  | 5803.5  | SS2  | SS    | 93    | 5-5-9          | 14             |   |   |   |                        |                          |                         |   |  |  |
| 8          |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 9          |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 10         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 11         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 12         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 13         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 14         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 15         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 16         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 17         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 18         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 19         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 20         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 21         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 22         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 23         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 24         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 25         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 26         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 27         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 28         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 29         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 30         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 31         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 32         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 33         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 34         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 35         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 36         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 37         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 38         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 39         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 40         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 41         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 42         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 43         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 44         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 45         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 46         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 47         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 48         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 49         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |
| 50         |           |                   |                                                                                                                                                                          |      |                                                                                   |                  |         |      |       |       |                |                |   |   |   |                        |                          |                         |   |  |  |

Golden Log Imperial / Soil-General 6 / Golden - 3 Imperial US / ASTM D2487 Auto (most common ASTM) / 2023-08-26

**APPENDIX B**

# Laboratory Testing



**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**DATE ASSIGNED:** 5/22/23

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**MOISTURE CONTENT OF SOIL (ASTM D2216)**

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| LAB #      | BORING & DEPTH       | WET WT.<br>(gram) | DRY WT.<br>(gram) | MOISTURE<br>CONTENT |
|------------|----------------------|-------------------|-------------------|---------------------|
| 23-1393-03 | BH1-SS3 (10-11.5')   | 591.0             | 542.2             | 9.0%                |
| 23-1393-06 | BH1-SS6 (25-26.5')   | 429.8             | 400.0             | 7.5%                |
| 23-1393-08 | BH1-SS8 (35-36.5')   | 542.5             | 513.4             | 5.7%                |
| 23-1393-11 | BH1-SS10 (50-51.5')  | 510.3             | 486.0             | 5.0%                |
| 23-1393-13 | BH1-SS11 (70-71.25') | 430.8             | 418.2             | 3.0%                |
| 23-1393-19 | BH2-SS4 (25-26.5')   | 532.6             | 506.9             | 5.1%                |
| 23-1393-20 | BH2-SS5 (30-31.5')   | 524.7             | 494.1             | 6.2%                |
| 23-1393-25 | BH2-SS8 (70-71.5')   | 492.1             | 472.0             | 4.3%                |
| 23-1393-27 | BH2-SS10 (85-86.5')  | 465.8             | 443.2             | 5.1%                |
| 23-1393-28 | BH3-Bulk (1-5')      | 857.6             | 802.9             | 6.8%                |
| 23-1393-30 | BH3-SS2 (5-5.83')    | 401.8             | 387.2             | 3.8%                |
| 23-1393-34 | BH4-SS4 (15-16.5')   | 458.8             | 426.7             | 7.5%                |
| 23-1393-36 | BH4-SS5 (25-26.5')   | 428.0             | 406.6             | 5.3%                |
| 23-1393-38 | BH4-SS7 (35-36.5')   | 474.5             | 450.6             | 5.3%                |
| 23-1393-41 | BH4-SS9 (50-51.5')   | 434.5             | 403.6             | 7.7%                |
| 23-1393-44 | BH4-SS11 (70-70.92') | 275.6             | 255.4             | 7.9%                |
| 23-1393-46 | BH5-Bulk (1-5')      | 927.8             | 879.1             | 5.5%                |
| 23-1393-48 | BH5-SS2 (5-6.5')     | 494.6             | 454.2             | 8.9%                |



**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**DATE ASSIGNED:** 5/22/23

**MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)  
GROUP SYMBOL, USCS (ASTM D2487)**

**PERCENT PASSING BY WEIGHT**

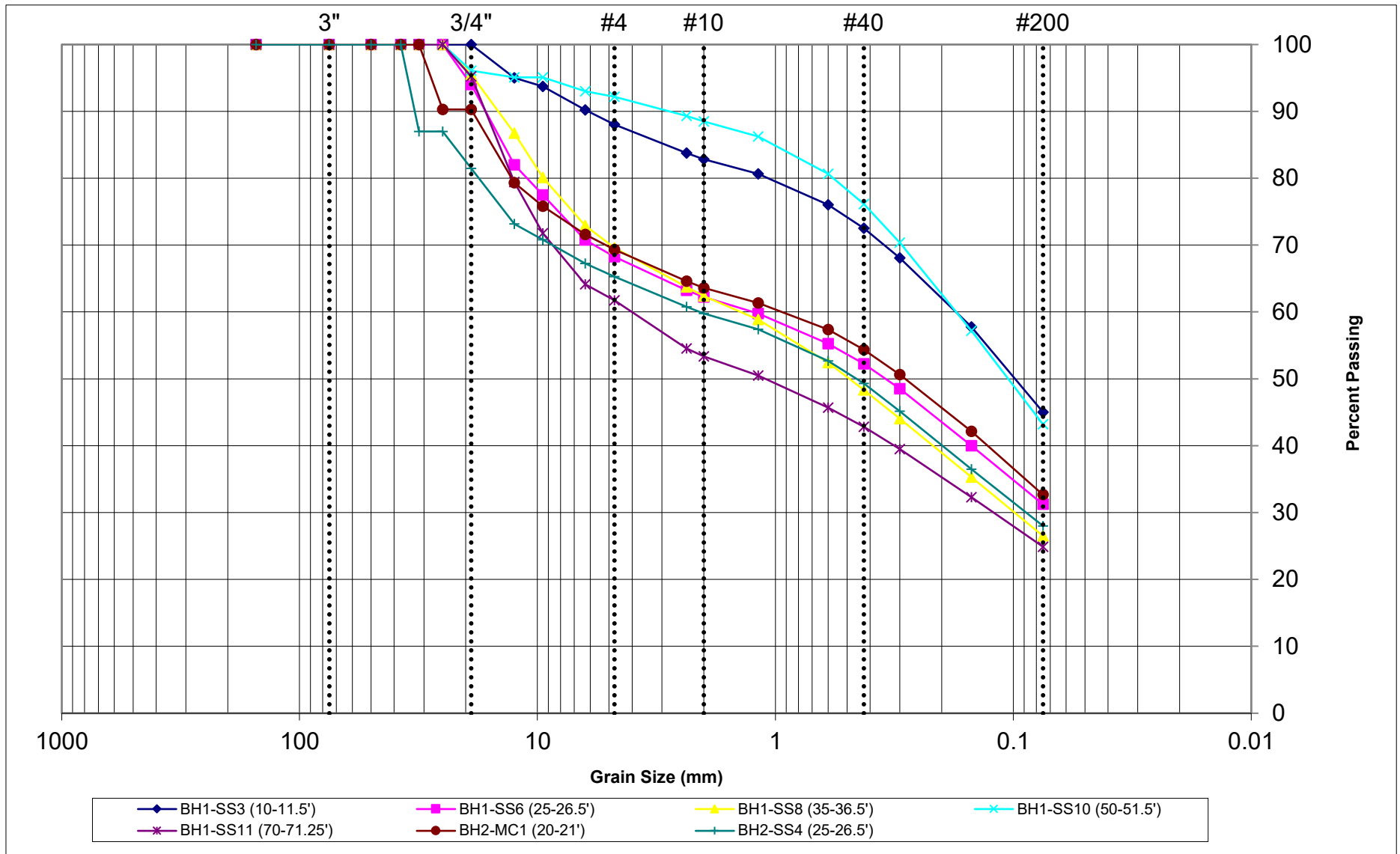
|                      |      |    |    | Silt or Clay | SAND |     |     |        |     |     |        |    | GRAVEL |      |      |      |        |        |        |     | COBBLES |     |            |
|----------------------|------|----|----|--------------|------|-----|-----|--------|-----|-----|--------|----|--------|------|------|------|--------|--------|--------|-----|---------|-----|------------|
|                      |      |    |    |              | Fine |     |     | Medium |     |     | Coarse |    | Fine   |      |      |      | Coarse |        |        |     |         |     |            |
| Location & Depth     | USCS | LL | PI | #200         | #100 | #50 | #40 | #30    | #16 | #10 | #8     | #4 | 1/4"   | 3/8" | 1/2" | 3/4" | 1"     | 1 1/4" | 1 1/2" | 2"  | 3"      | 6"  | Lab #      |
| BH1-SS3 (10-11.5')   | SM   | NV | NP | 45           | 58   | 68  | 73  | 76     | 81  | 83  | 84     | 88 | 90     | 94   | 95   | 100  | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-03 |
| BH1-SS6 (25-26.5')   | SM   | NV | NP | 31           | 40   | 49  | 52  | 55     | 60  | 62  | 63     | 68 | 71     | 78   | 82   | 94   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-06 |
| BH1-SS8 (35-36.5')   | SM   | NV | NP | 27           | 35   | 44  | 48  | 52     | 59  | 62  | 64     | 70 | 73     | 80   | 87   | 96   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-08 |
| BH1-SS10 (50-51.5')  | SM   | NV | NP | 43           | 57   | 70  | 76  | 81     | 86  | 88  | 89     | 92 | 93     | 95   | 95   | 96   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-11 |
| BH1-SS11 (70-71.25') | GM   | NV | NP | 25           | 32   | 39  | 43  | 46     | 50  | 53  | 55     | 62 | 64     | 72   | 79   | 95   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-13 |
| BH2-MC1 (20-21')     | SM   | NV | NP | 33           | 42   | 51  | 54  | 57     | 61  | 64  | 65     | 69 | 72     | 76   | 79   | 90   | 90     | 100    | 100    | 100 | 100     | 100 | 23-1393-18 |
| BH2-SS4 (25-26.5')   | SM   | NV | NP | 28           | 36   | 45  | 49  | 53     | 57  | 60  | 61     | 65 | 67     | 71   | 73   | 81   | 87     | 87     | 100    | 100 | 100     | 100 | 23-1393-19 |
|                      |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |
|                      |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |
|                      |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |



**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**DATE ASSIGNED:** 5/22/23

### MECHANICAL SIEVE ANALYSIS GRAPHS





**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**DATE ASSIGNED:** 5/22/23

**MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)  
GROUP SYMBOL, USCS (ASTM D2487)**

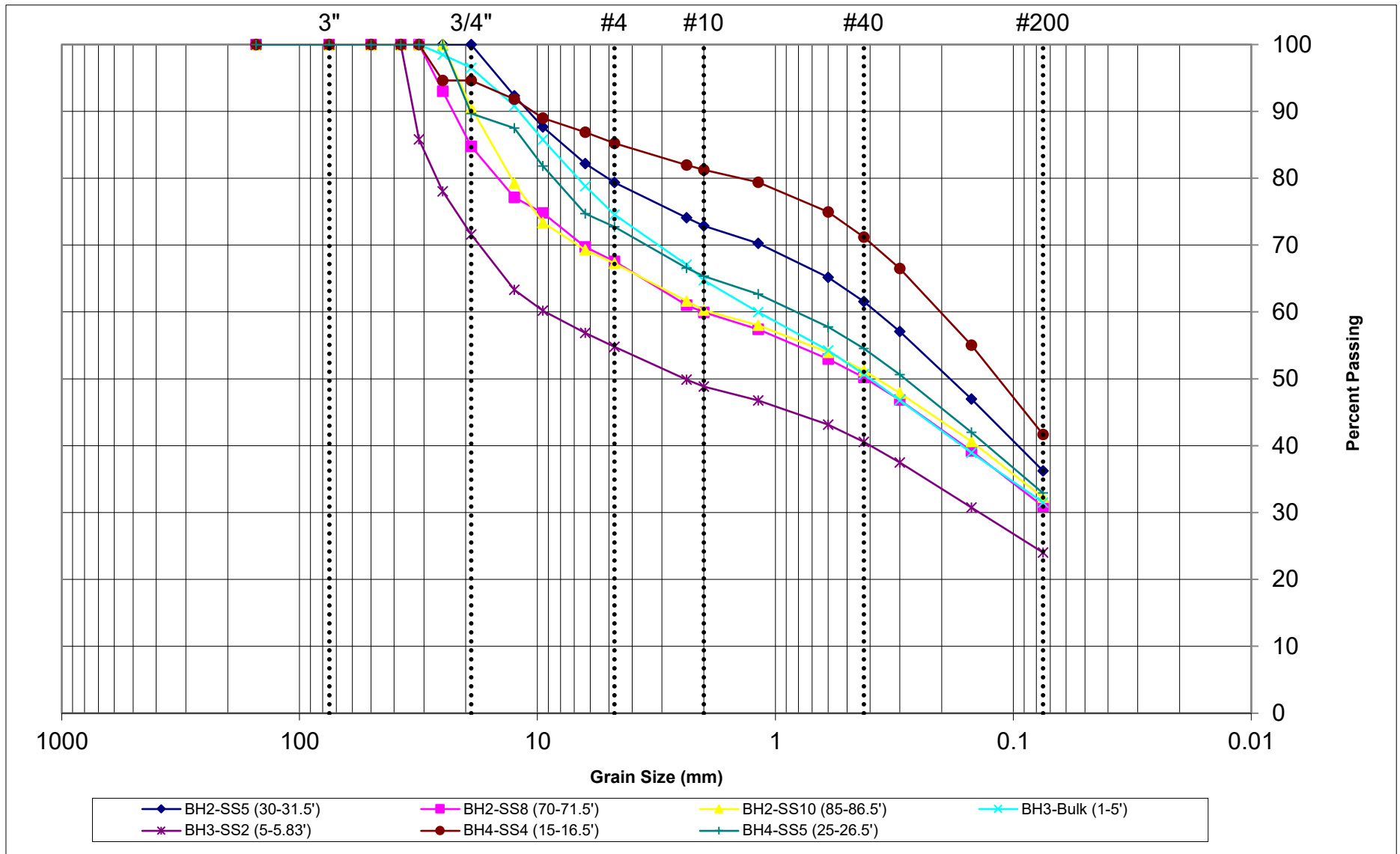
**PERCENT PASSING BY WEIGHT**

|                     |      |    |    | Silt or Clay | SAND |     |     |        |     |     |        |    | GRAVEL |      |      |      |        |        |        |     | COBBLES |     |            |
|---------------------|------|----|----|--------------|------|-----|-----|--------|-----|-----|--------|----|--------|------|------|------|--------|--------|--------|-----|---------|-----|------------|
|                     |      |    |    |              | Fine |     |     | Medium |     |     | Coarse |    | Fine   |      |      |      | Coarse |        |        |     |         |     |            |
| Location & Depth    | USCS | LL | PI | #200         | #100 | #50 | #40 | #30    | #16 | #10 | #8     | #4 | 1/4"   | 3/8" | 1/2" | 3/4" | 1"     | 1 1/4" | 1 1/2" | 2"  | 3"      | 6"  | Lab #      |
| BH2-SS5 (30-31.5')  | SM   | NV | NP | 36           | 47   | 57  | 62  | 65     | 70  | 73  | 74     | 79 | 82     | 88   | 92   | 100  | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-20 |
| BH2-SS8 (70-71.5')  | SM   | NV | NP | 31           | 39   | 47  | 50  | 53     | 57  | 60  | 61     | 68 | 70     | 75   | 77   | 85   | 93     | 100    | 100    | 100 | 100     | 100 | 23-1393-25 |
| BH2-SS10 (85-86.5') | SM   | NV | NP | 32           | 41   | 48  | 51  | 54     | 58  | 60  | 62     | 67 | 69     | 73   | 79   | 91   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-27 |
| BH3-Bulk (1-5')     | SM   | NV | NP | 32           | 39   | 47  | 51  | 54     | 60  | 65  | 67     | 75 | 79     | 86   | 91   | 97   | 98     | 100    | 100    | 100 | 100     | 100 | 23-1393-28 |
| BH3-SS2 (5-5.83')   | GM   | NV | NP | 24           | 31   | 37  | 41  | 43     | 47  | 49  | 50     | 55 | 57     | 60   | 63   | 72   | 78     | 86     | 100    | 100 | 100     | 100 | 23-1393-30 |
| BH4-SS4 (15-16.5')  | SM   | NV | NP | 42           | 55   | 67  | 71  | 75     | 79  | 81  | 82     | 85 | 87     | 89   | 92   | 95   | 95     | 100    | 100    | 100 | 100     | 100 | 23-1393-34 |
| BH4-SS5 (25-26.5')  | SM   | NV | NP | 33           | 42   | 51  | 55  | 58     | 63  | 65  | 67     | 73 | 75     | 82   | 87   | 90   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-36 |
|                     |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |
|                     |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |
|                     |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |

**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**DATE ASSIGNED:** 5/22/23

### MECHANICAL SIEVE ANALYSIS GRAPHS





**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**DATE ASSIGNED:** 5/22/23

**MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)  
GROUP SYMBOL, USCS (ASTM D2487)**

**PERCENT PASSING BY WEIGHT**

|                      |      |    |    | Silt or Clay | SAND |     |     |        |     |     |        |    | GRAVEL |      |      |      |        |        |        |     | COBBLES |     |            |
|----------------------|------|----|----|--------------|------|-----|-----|--------|-----|-----|--------|----|--------|------|------|------|--------|--------|--------|-----|---------|-----|------------|
|                      |      |    |    |              | Fine |     |     | Medium |     |     | Coarse |    | Fine   |      |      |      | Coarse |        |        |     |         |     |            |
| Location & Depth     | USCS | LL | PI | #200         | #100 | #50 | #40 | #30    | #16 | #10 | #8     | #4 | 1/4"   | 3/8" | 1/2" | 3/4" | 1"     | 1 1/4" | 1 1/2" | 2"  | 3"      | 6"  | Lab #      |
| BH4-SS7 (35-36.5')   | SM   | NV | NP | 31           | 41   | 53  | 59  | 63     | 65  | 68  | 69     | 74 | 76     | 81   | 85   | 92   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-38 |
| BH4-MC2 (40-41')     | SM   | NV | NP | 37           | 48   | 57  | 61  | 65     | 69  | 72  | 73     | 78 | 80     | 82   | 84   | 87   | 90     | 100    | 100    | 100 | 100     | 100 | 23-1393-39 |
| BH4-SS9 (50-51.5')   | SM   | NV | NP | 38           | 50   | 64  | 70  | 75     | 83  | 86  | 87     | 91 | 93     | 97   | 98   | 100  | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-41 |
| BH4-MC3 (60-61')     | SM   | NV | NP | 42           | 54   | 66  | 71  | 76     | 81  | 84  | 85     | 88 | 91     | 95   | 99   | 100  | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-43 |
| BH4-SS11 (70-70.92') | SM   | NV | NP | 39           | 53   | 65  | 71  | 75     | 79  | 80  | 81     | 83 | 85     | 86   | 88   | 92   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-44 |
| BH5-Bulk (1-5')      | SM   | NV | NP | 26           | 32   | 39  | 42  | 45     | 52  | 57  | 60     | 68 | 74     | 84   | 91   | 97   | 99     | 100    | 100    | 100 | 100     | 100 | 23-1393-46 |
| BH5-SS2 (5-6.5')     | SM   | NV | NP | 37           | 48   | 59  | 64  | 68     | 74  | 77  | 78     | 83 | 85     | 89   | 92   | 97   | 100    | 100    | 100    | 100 | 100     | 100 | 23-1393-48 |
|                      |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |
|                      |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |
|                      |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |
|                      |      |    |    |              |      |     |     |        |     |     |        |    |        |      |      |      |        |        |        |     |         |     |            |



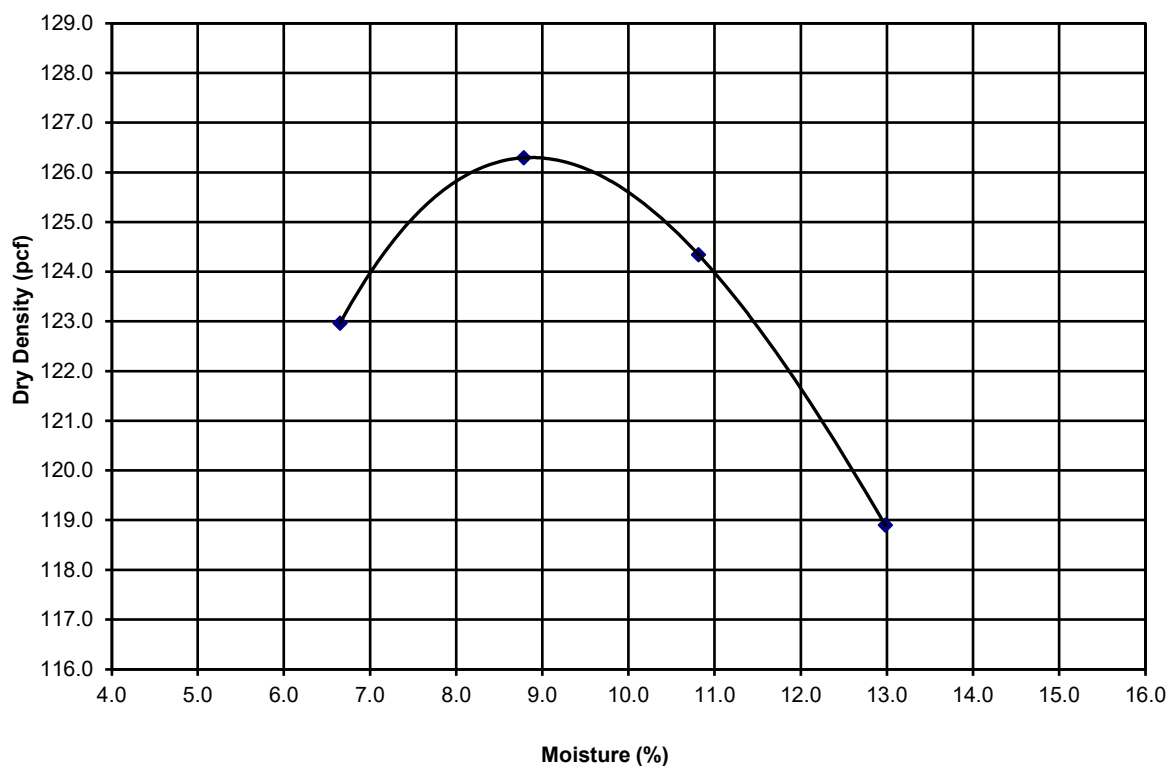


**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil  
**SAMPLE SOURCE:** BH5-Bulk (1-5')

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**LAB NO:** 23-1393-46  
**DATE SAMPLED:** 5/23/23

**LABORATORY COMPACTION CHARACTERISTICS OF SOILS USING  
MODIFIED EFFORTS (56,000ft-lb-ft/cu.ft) (ASTMD1557A)**

|                            |       |
|----------------------------|-------|
| MAXIMUM DRY DENSITY (pcf): | 126.3 |
| OPTIMUM MOISTURE (%):      | 8.9   |





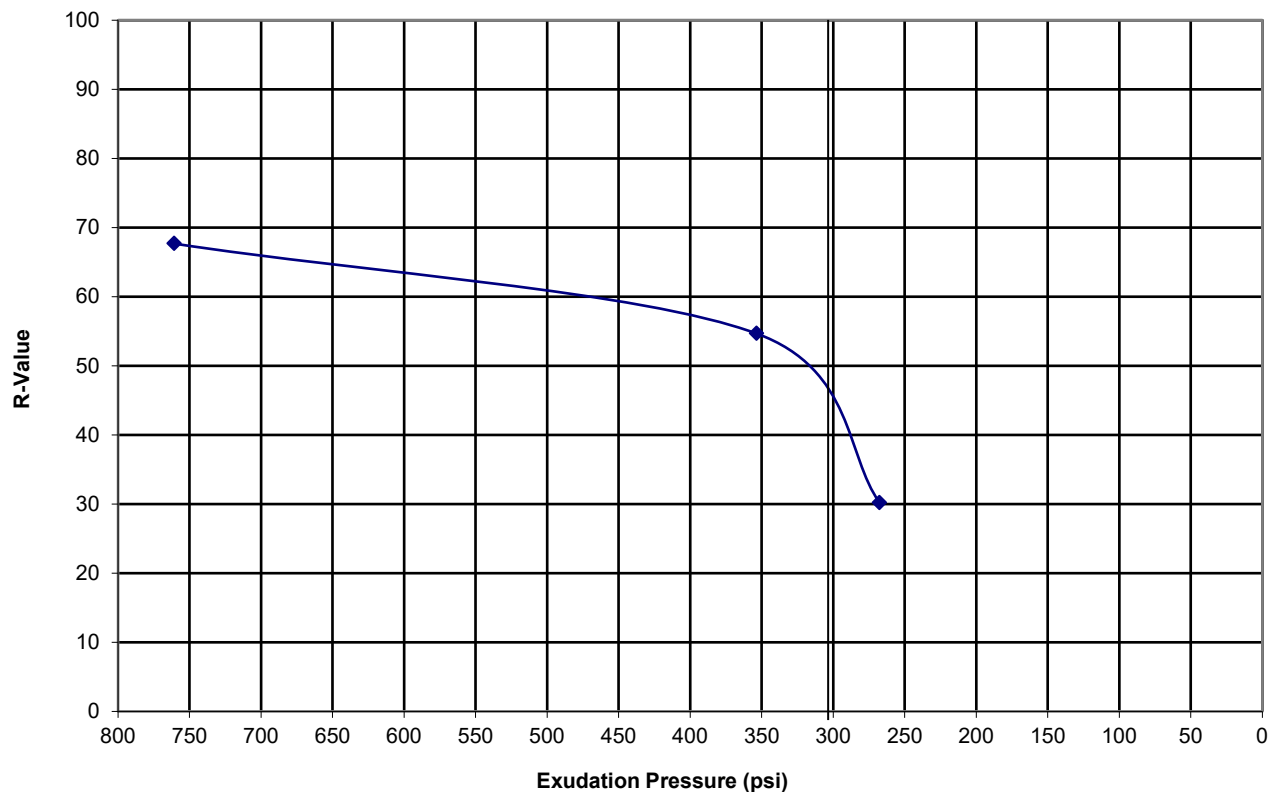


**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil  
**SAMPLE SOURCE:** BH3-Bulk (1-5')

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**LAB NO:** 23-1393-28  
**DATE SAMPLED:** 05/23/23

**RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)**

| SPECIMEN ID                  | A     | B     | C     |
|------------------------------|-------|-------|-------|
| Moisture Content             | 10.3% | 9.4%  | 8.5%  |
| Compaction Pressure (psi)    | 30    | 35    | 35    |
| Specimen Height (inches)     | 2.54  | 2.55  | 2.50  |
| Dry Density (pcf)            | 129.2 | 128.9 | 130.8 |
| Horiz. Pres. @ 1000lbs (psi) | 40.0  | 25.0  | 18.0  |
| Horiz. Pres. @ 2000lbs (psi) | 83.0  | 48.0  | 33.0  |
| Displacement                 | 5.36  | 4.83  | 4.59  |
| Expansion Pressure (psi)     | 0.0   | 0.0   | 0.0   |
| Exudation Pressure (psi)     | 268   | 354   | 761   |
| R Value                      | 30    | 55    | 68    |



**R Value at 300 PSI =** 46

WSP USA  
3630 E Wier Ave.  
Phoenix, AZ 85040

REVIEWED BY

*Hiram Franco*



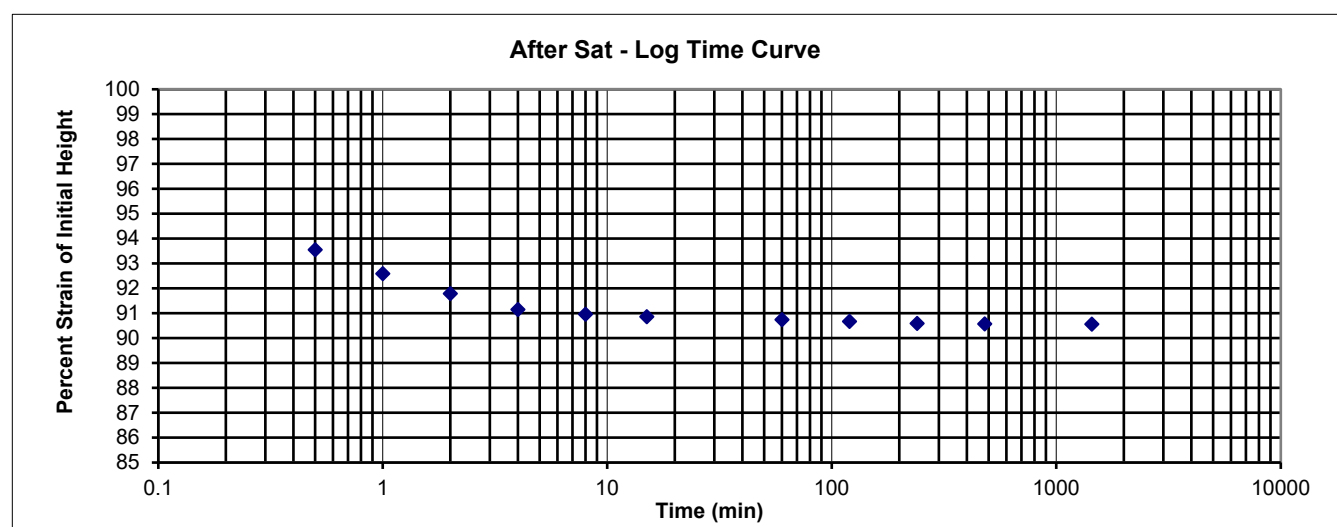
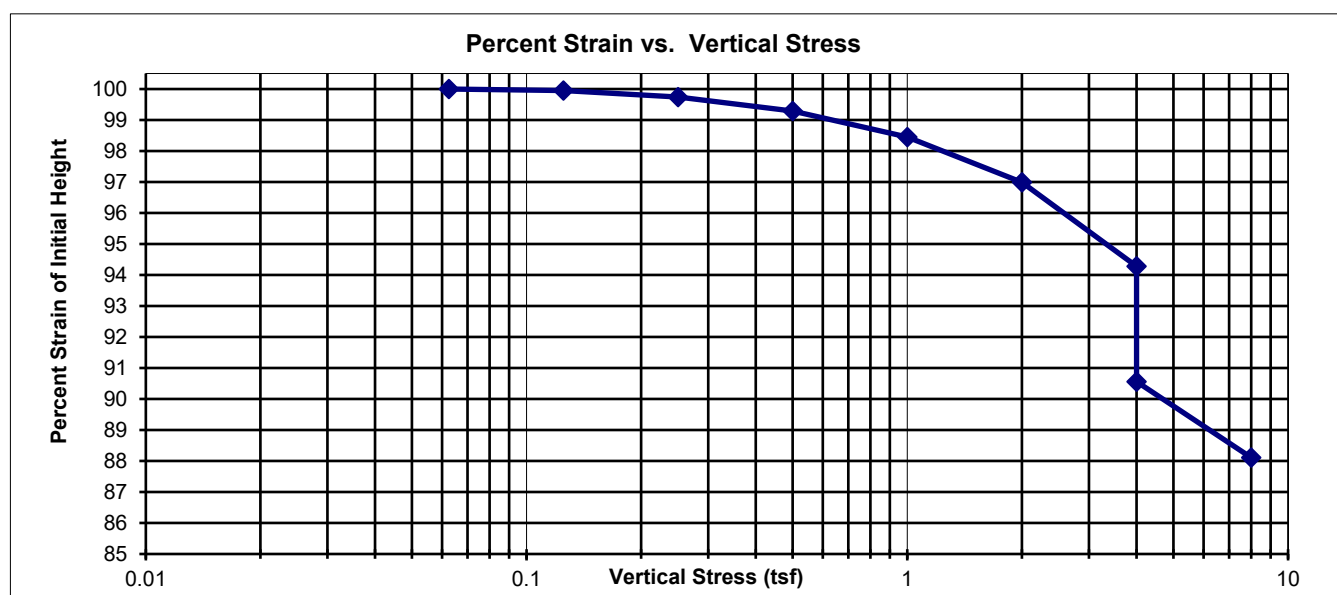
**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil  
**SAMPLE SOURCE:** BH2-MC1 (20-21')  
**SAMPLE PREP:** In Situ

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**LAB NO:** 23-1393-18  
**DATE ASSIGNED:** 5/22/23

### MEASUREMENT OF COLLAPSE POTENTIAL OF SOILS (ASTM D5333)

INITIAL VOLUME (cu.in): 4.60  
INITIAL MOISTURE CONTENT: 6.5%  
INITIAL DRY DENSITY(pcf): 107.9  
INITIAL DEGREE OF SATURATION: 33%  
INITIAL VOID RATIO: 0.54  
SATURATED AT: 4 tsf

VOLUME BEFORE SAT (cu.in): 4.34  
FINAL VOLUME AFTER SAT (cu.in): 3.68  
FINAL MOISTURE CONTENT: 12.6%  
DRY DENSITY BEFORE SAT (pcf): 113.9  
FINAL DEGREE OF SATURATION: 145%  
FINAL VOID RATIO: 0.23  
FINAL DRY DENSITY AT 4 TSF: 134.4



**Note:** The final dry density is calculated using final specimen height at 4 tsf.



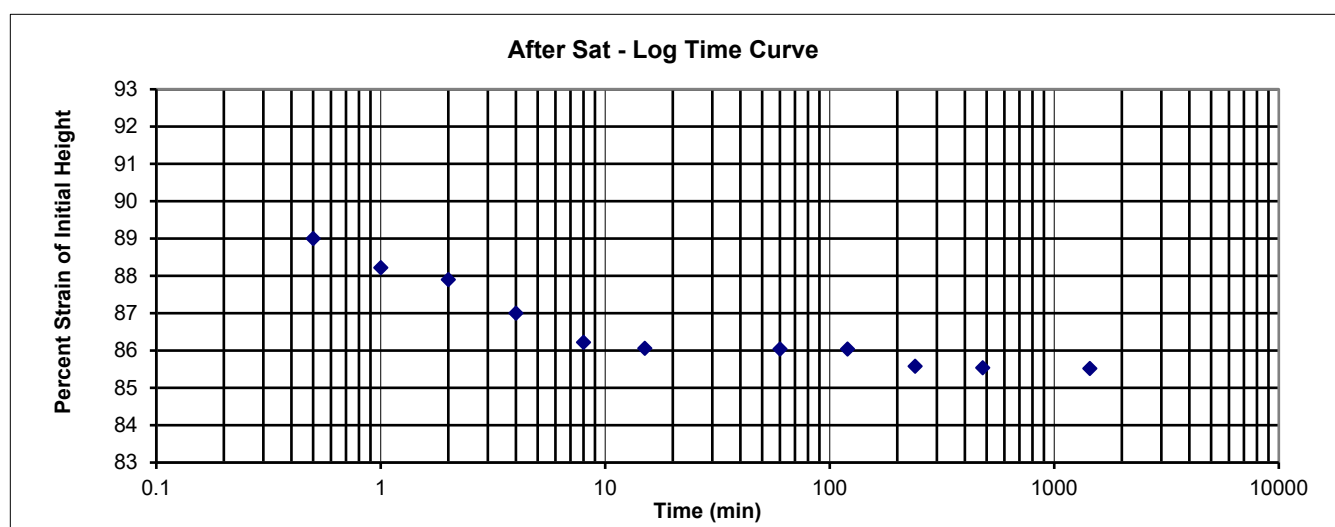
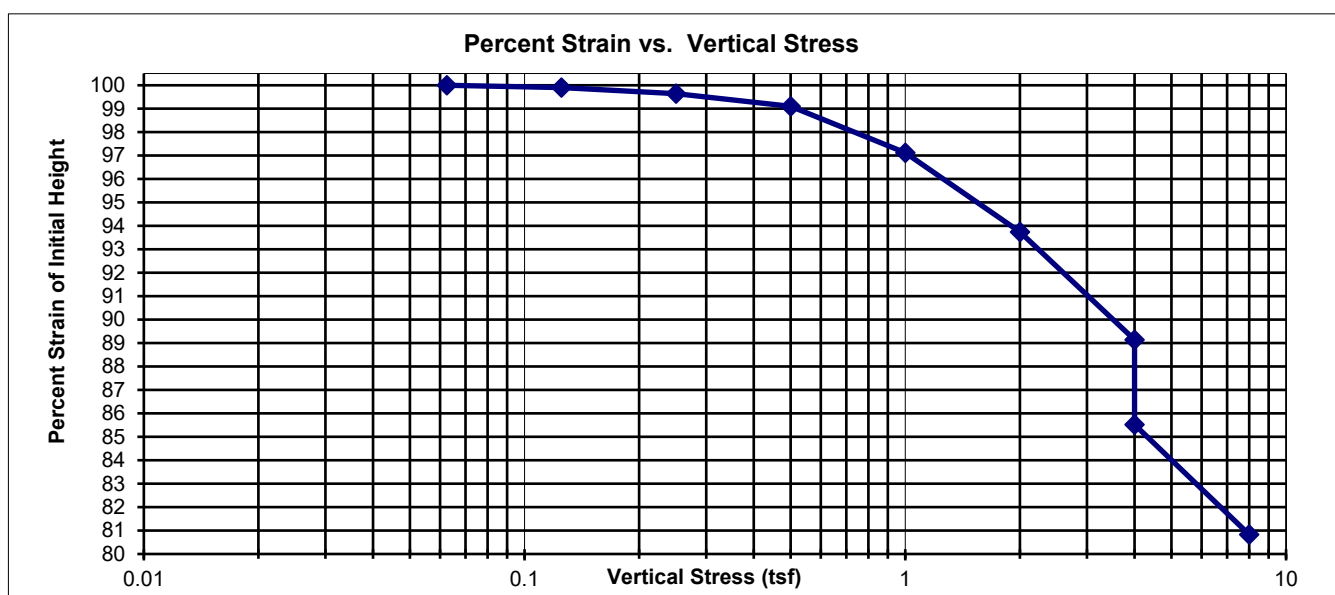
**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil  
**SAMPLE SOURCE:** BH4-MC2 (40-41')  
**SAMPLE PREP:** In Situ

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**LAB NO:** 23-1393-39  
**DATE ASSIGNED:** 5/22/23

### MEASUREMENT OF COLLAPSE POTENTIAL OF SOILS (ASTM D5333)

INITIAL VOLUME (cu.in): 4.60  
INITIAL MOISTURE CONTENT: 10.1%  
INITIAL DRY DENSITY(pcf): 98.1  
INITIAL DEGREE OF SATURATION: 39%  
INITIAL VOID RATIO: 0.69  
SATURATED AT: 4 tsf

VOLUME BEFORE SAT (cu.in): 4.10  
FINAL VOLUME AFTER SAT (cu.in): 3.80  
FINAL MOISTURE CONTENT: 13.9%  
DRY DENSITY BEFORE SAT (pcf): 109.5  
FINAL DEGREE OF SATURATION: 93%  
FINAL VOID RATIO: 0.40  
FINAL DRY DENSITY AT 4 TSF: 118.3



**Note:** The final dry density is calculated using final specimen height at 4 tsf.



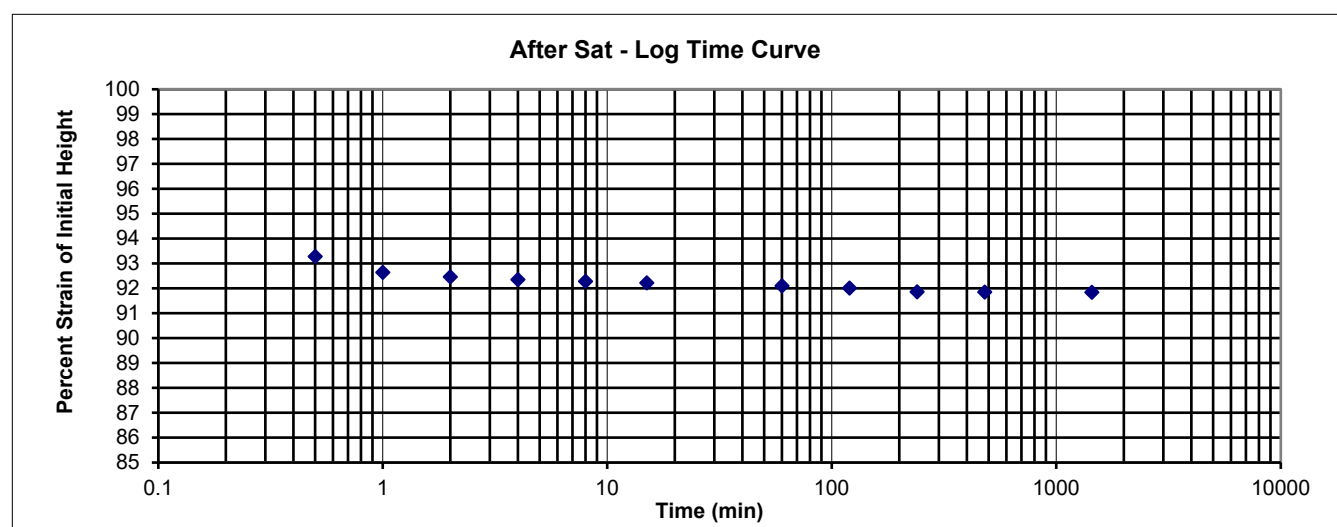
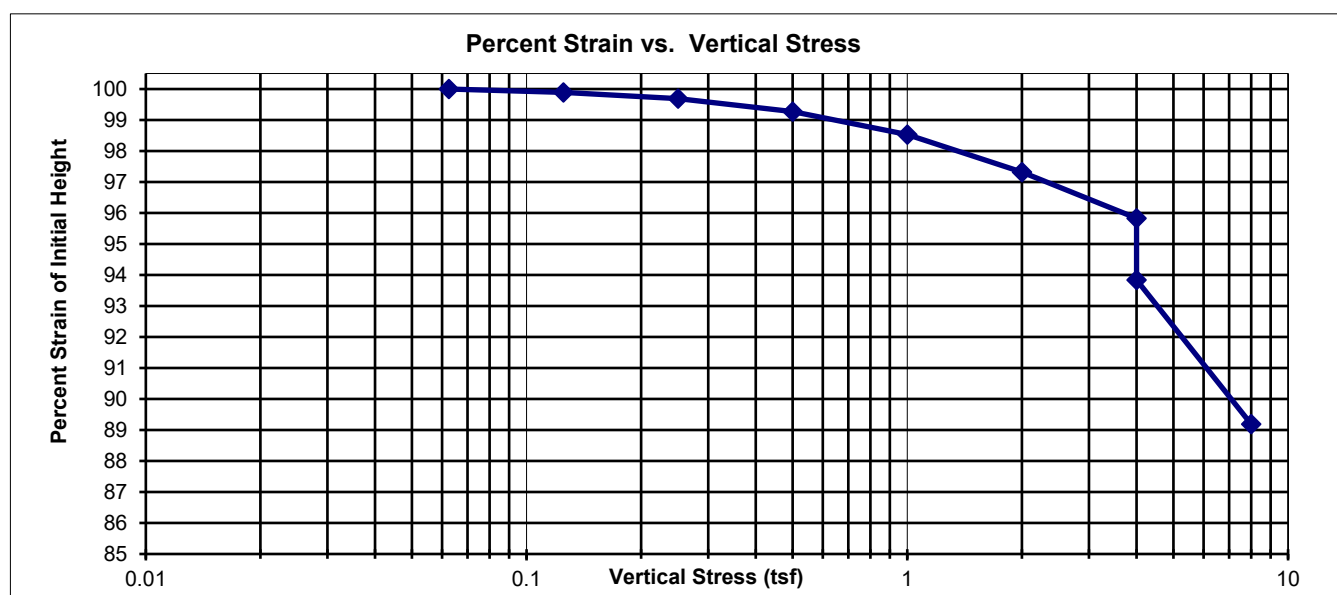
**PROJECT:** RFTA - Glenwood Maintenance Facility  
**LOCATION:** Lakewood, CO  
**MATERIAL:** Soil  
**SAMPLE SOURCE:** BH4-MC3 (60-61')  
**SAMPLE PREP:** In Situ

**JOB NO:** 17-2023-4233  
**WORK ORDER NO:** 1  
**LAB NO:** 23-1393-43  
**DATE ASSIGNED:** 5/22/23

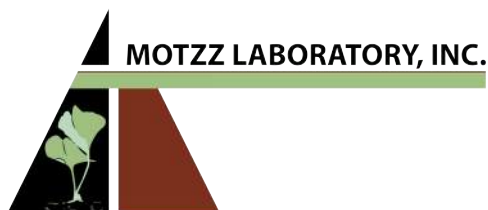
### MEASUREMENT OF COLLAPSE POTENTIAL OF SOILS (ASTM D5333)

INITIAL VOLUME (cu.in): 4.60  
INITIAL MOISTURE CONTENT: 5.5%  
INITIAL DRY DENSITY(pcf): 108.4  
INITIAL DEGREE OF SATURATION: 28%  
INITIAL VOID RATIO: 0.53  
SATURATED AT: 4 tsf

VOLUME BEFORE SAT (cu.in): 4.41  
FINAL VOLUME AFTER SAT (cu.in): 3.59  
FINAL MOISTURE CONTENT: 12.6%  
DRY DENSITY BEFORE SAT (pcf): 112.5  
FINAL DEGREE OF SATURATION: 171%  
FINAL VOID RATIO: 0.20  
FINAL DRY DENSITY AT 4 TSF: 138.3



**Note:** The final dry density is calculated using final specimen height at 4 tsf.



MOTZZ LABORATORY, INC.

Report: 946881  
Reported: 6/15/2023  
Received: 6/5/2023  
PO: 17-2023-4233

## Laboratory Analysis Report

WSP USA Environment & Infrastructure Inc.

Franco Escalante

4600 E. Washington Street Suite 600

Phoenix, Arizona 85034

Project: 17-2023-4233 WO1

|            |                            |
|------------|----------------------------|
| Lab Number | Sample ID                  |
| 946881-1   | 23-1393-49 BH1-Composite 1 |

### Test Parameter

| Test                        | Method     | Result | Units  |
|-----------------------------|------------|--------|--------|
| pH (CaCl2)                  | ASTM D6276 | 7.9    | SU     |
| pH (Water)                  | ASTM D4972 | 8.2    | SU     |
| Resistivity (at Saturation) | ASTM G187  | 1141   | ohm-cm |
| Sulfate                     | ASTM DD516 | 8      | ppm    |
| Chloride                    | ASTM D512c | 196    | ppm    |

|            |                            |
|------------|----------------------------|
| Lab Number | Sample ID                  |
| 946881-2   | 23-1393-50 BH4-Composite 2 |

### Test Parameter

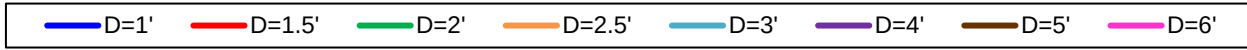
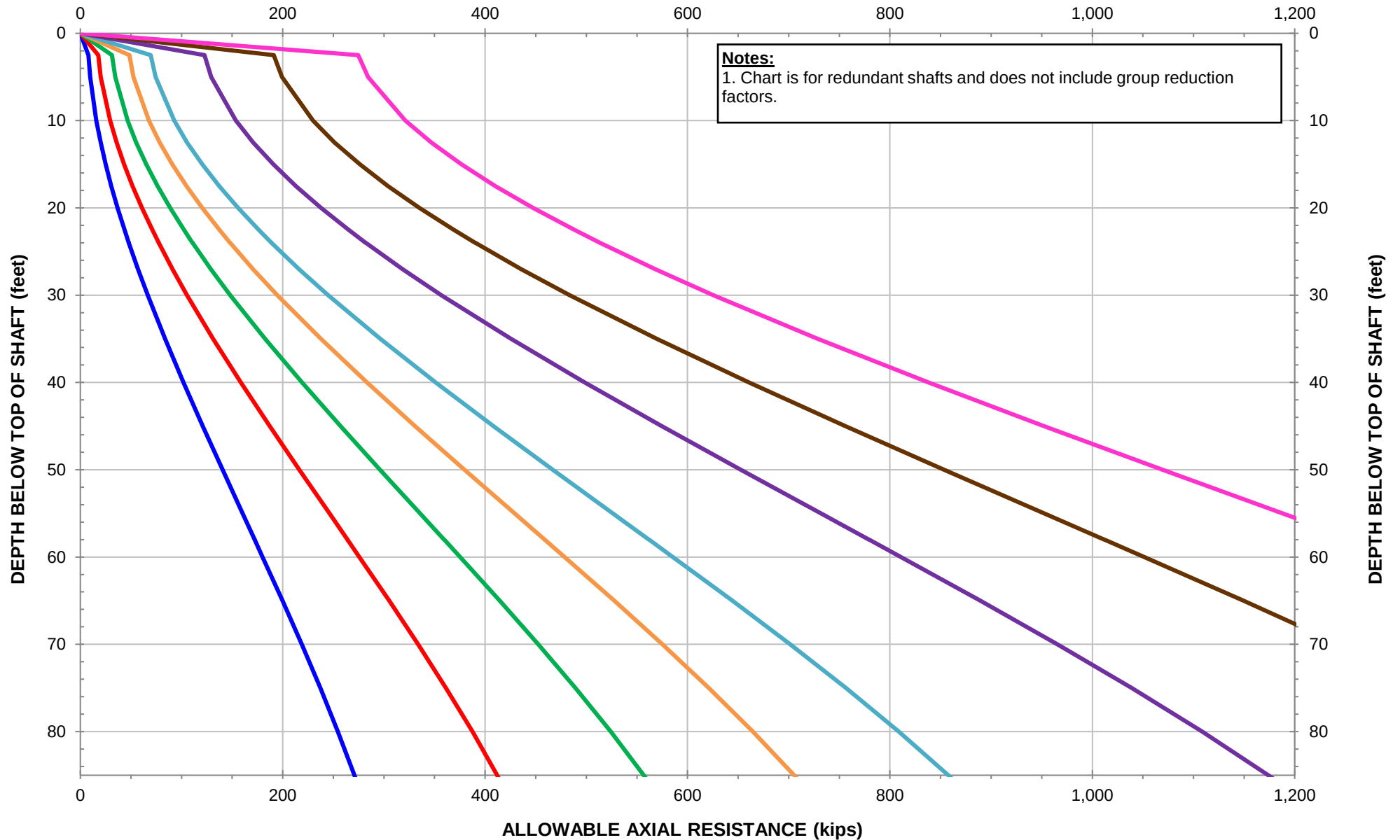
| Test                        | Method     | Result | Units  |
|-----------------------------|------------|--------|--------|
| pH (CaCl2)                  | ASTM D6276 | 7.9    | SU     |
| pH (Water)                  | ASTM D4972 | 8.3    | SU     |
| Resistivity (at Saturation) | ASTM G187  | 1476   | ohm-cm |
| Sulfate                     | ASTM D516  | 9      | ppm    |
| Chloride                    | ASTM D512c | 230    | ppm    |

**APPENDIX C**

## Drilled Shaft Axial Capacity Charts



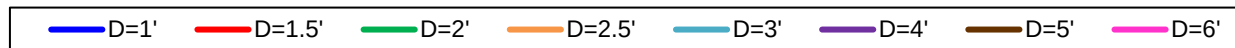
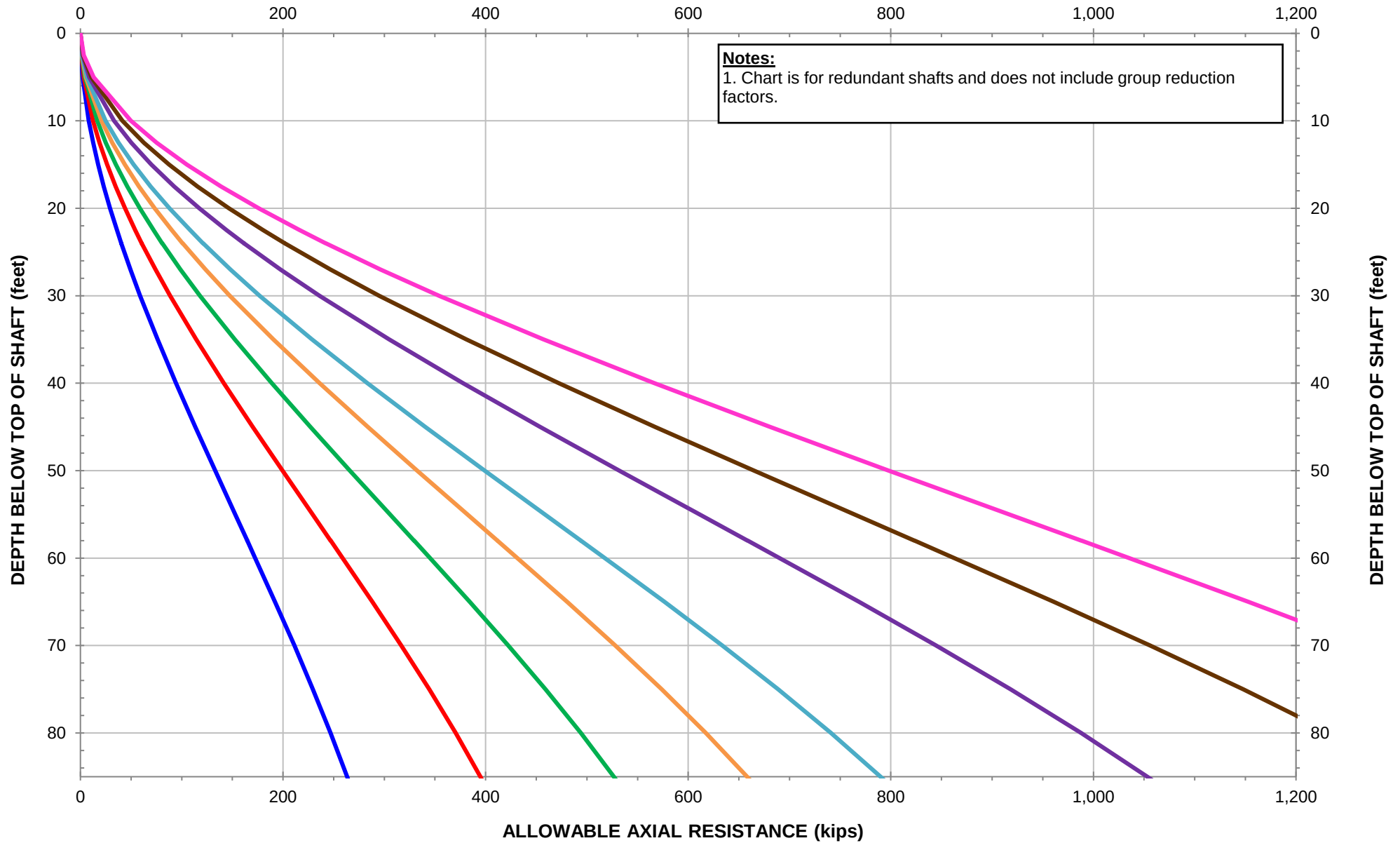
RFTA GMF Phase 6: Admin Building



Made By: RMP (Rev. 0)  
Checked By: RAP  
Approved By: RMP



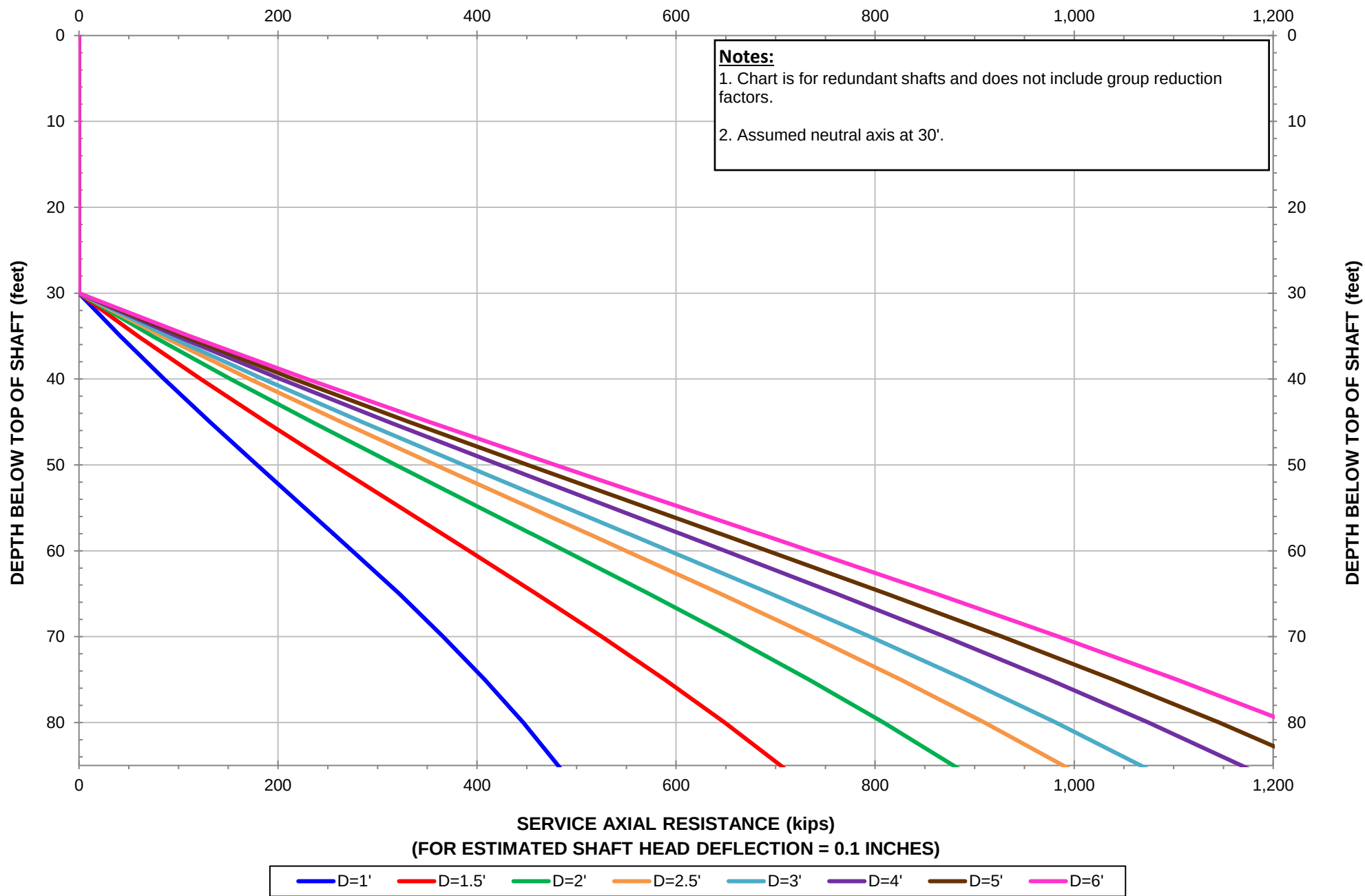
## RFTA GMF Phase 6: Admin Building - Uplift



Made By: RMP (Rev. 0)  
 Checked By: RAP  
 Approved By: RMP



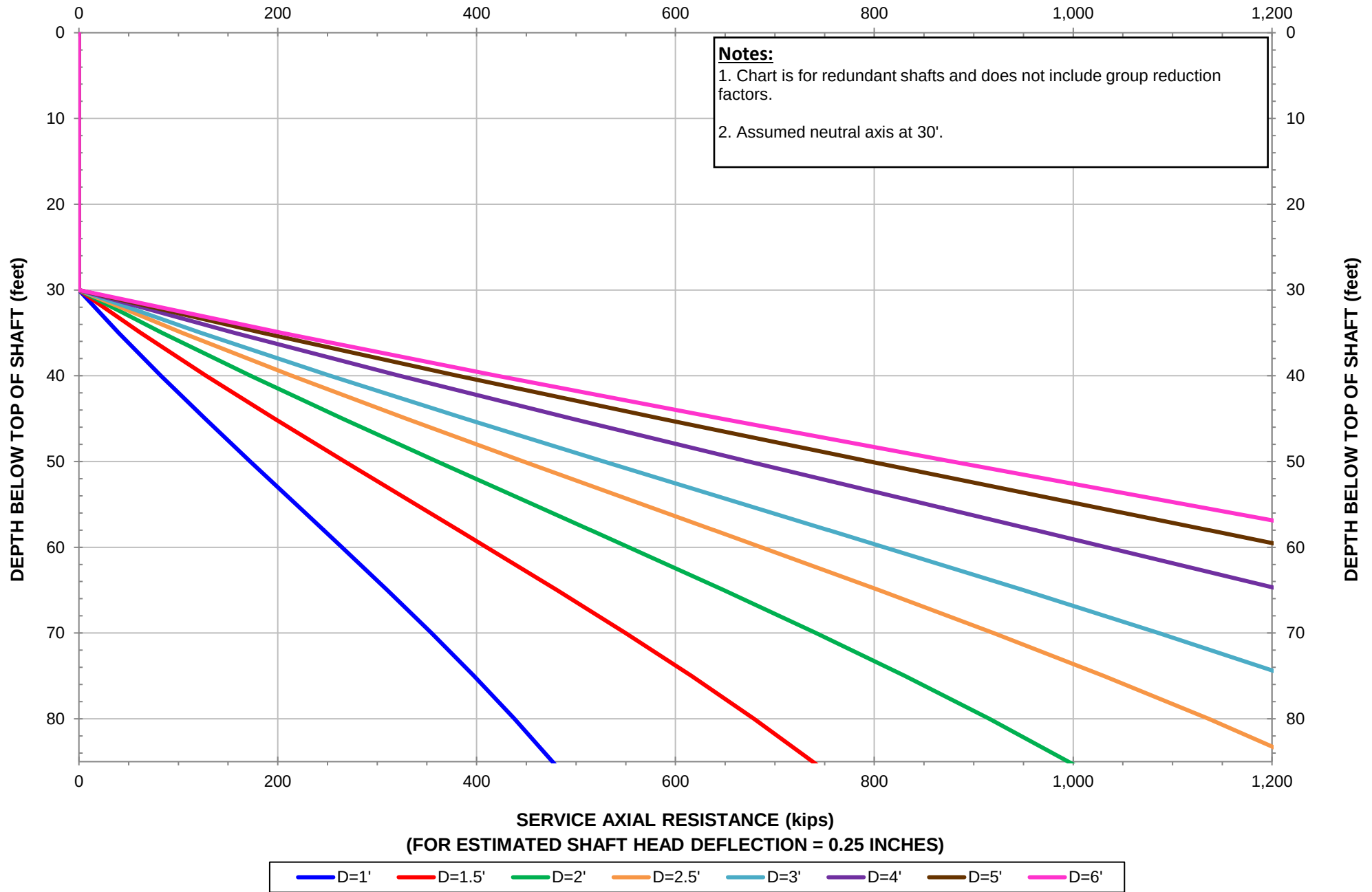
**SERVICE LIMIT DRILLED SHAFT AXIAL RESISTANCE**  
**RFTA GMF Phase 6: Admin Building - Service with Downdrag**



Made By: RMP (Rev. 0)  
 Checked By: RAP  
 Approved By: RMP



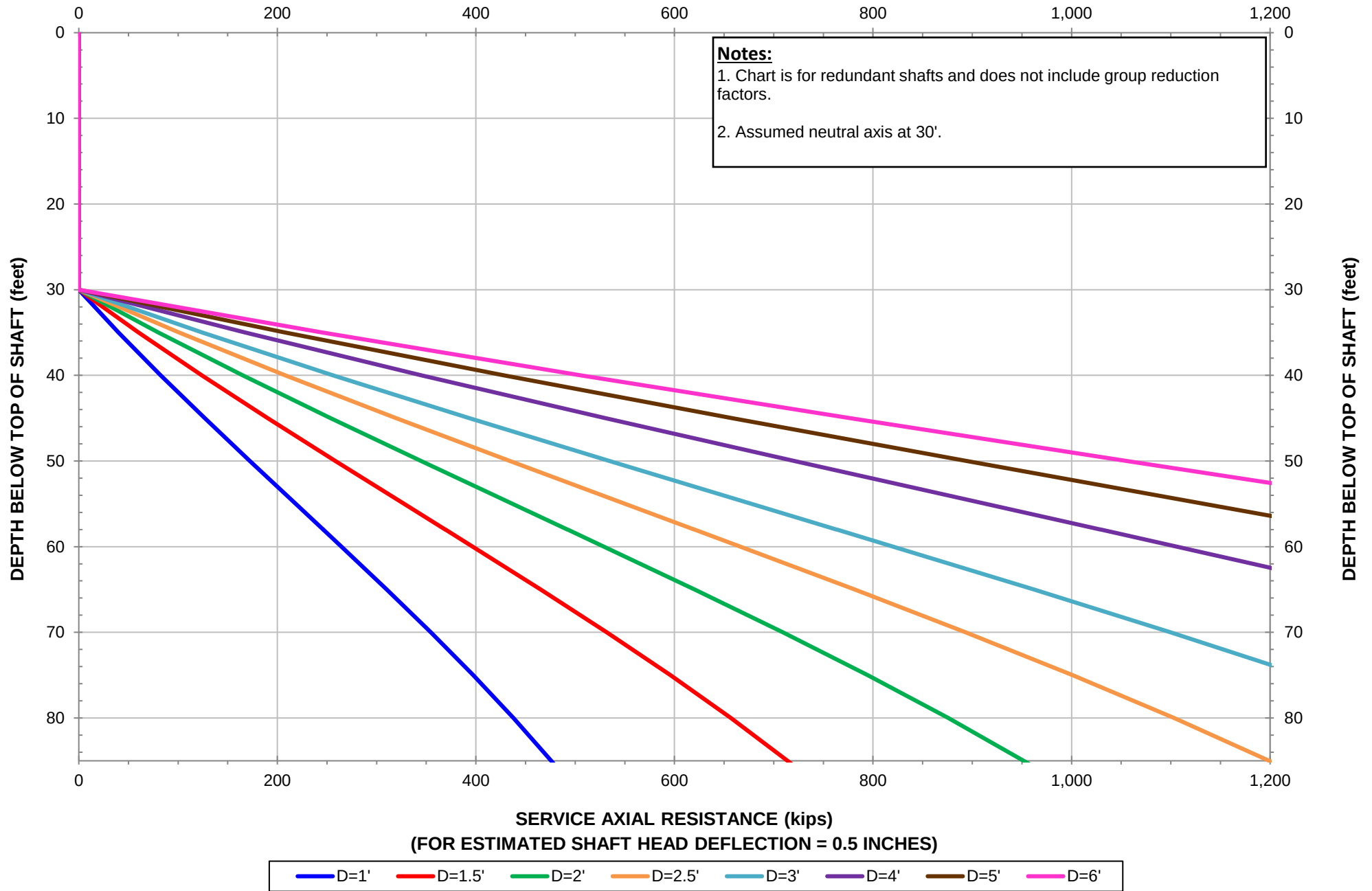
## RFTA GMF Phase 6: Admin Building - Service with Downdrag



Made By: RMP (Rev. 0)  
 Checked By: RAP  
 Approved By: RMP



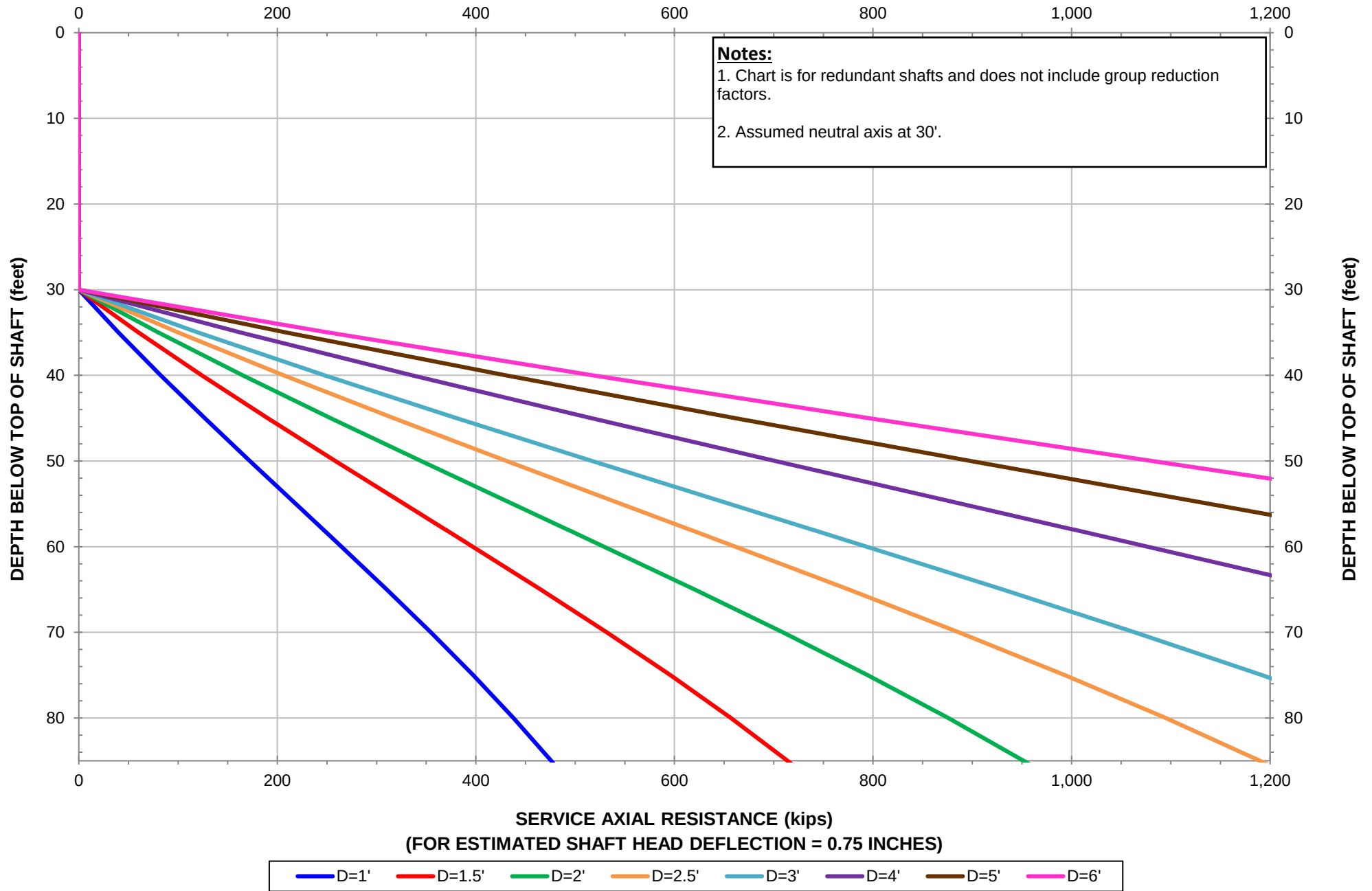
## RFTA GMF Phase 6: Admin Building - Service with Downdrag



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 Checked By: RAP  
 Approved By: RMP

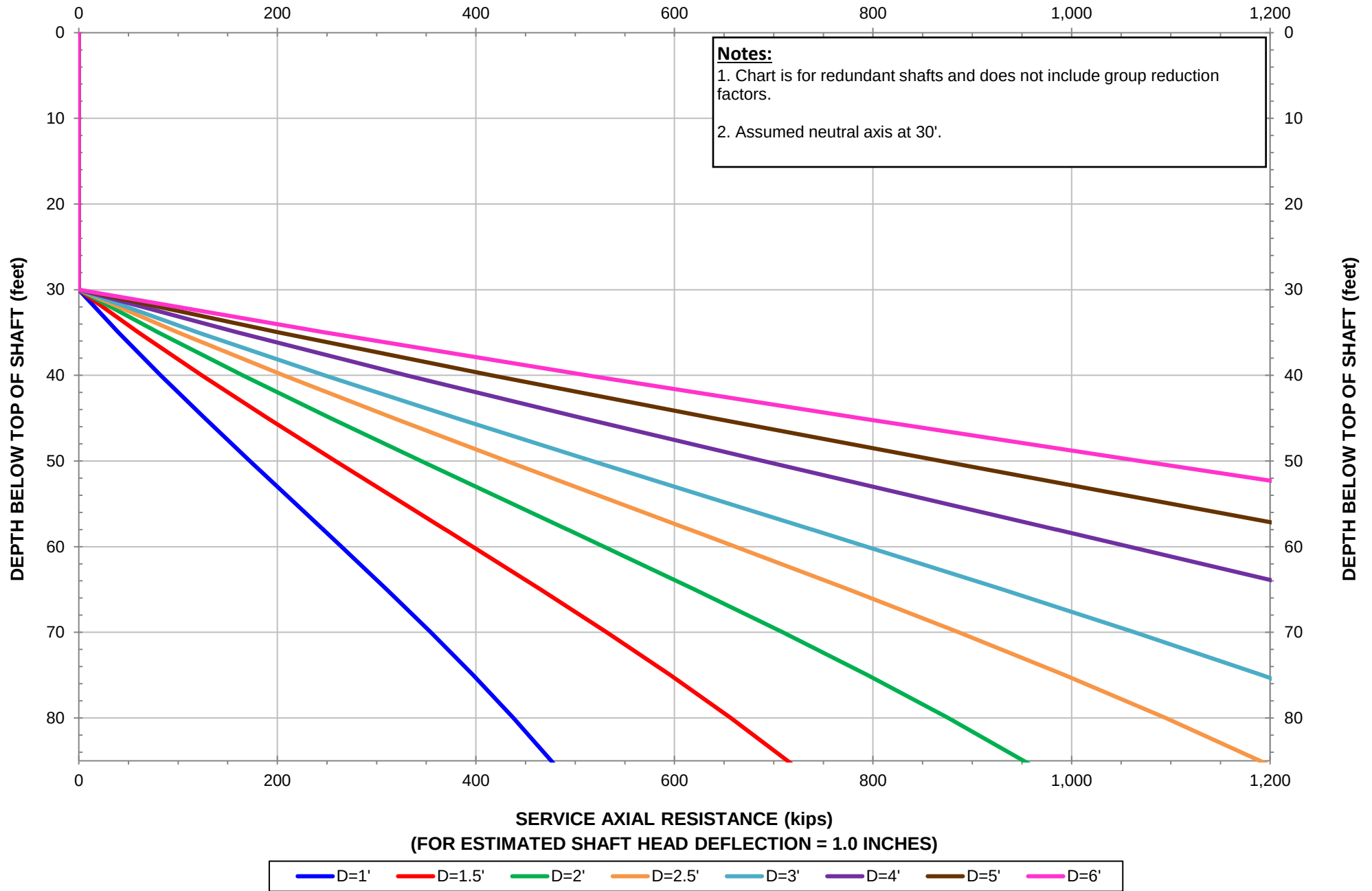


## RFTA GMF Phase 6: Admin Building - Service with Downdrag





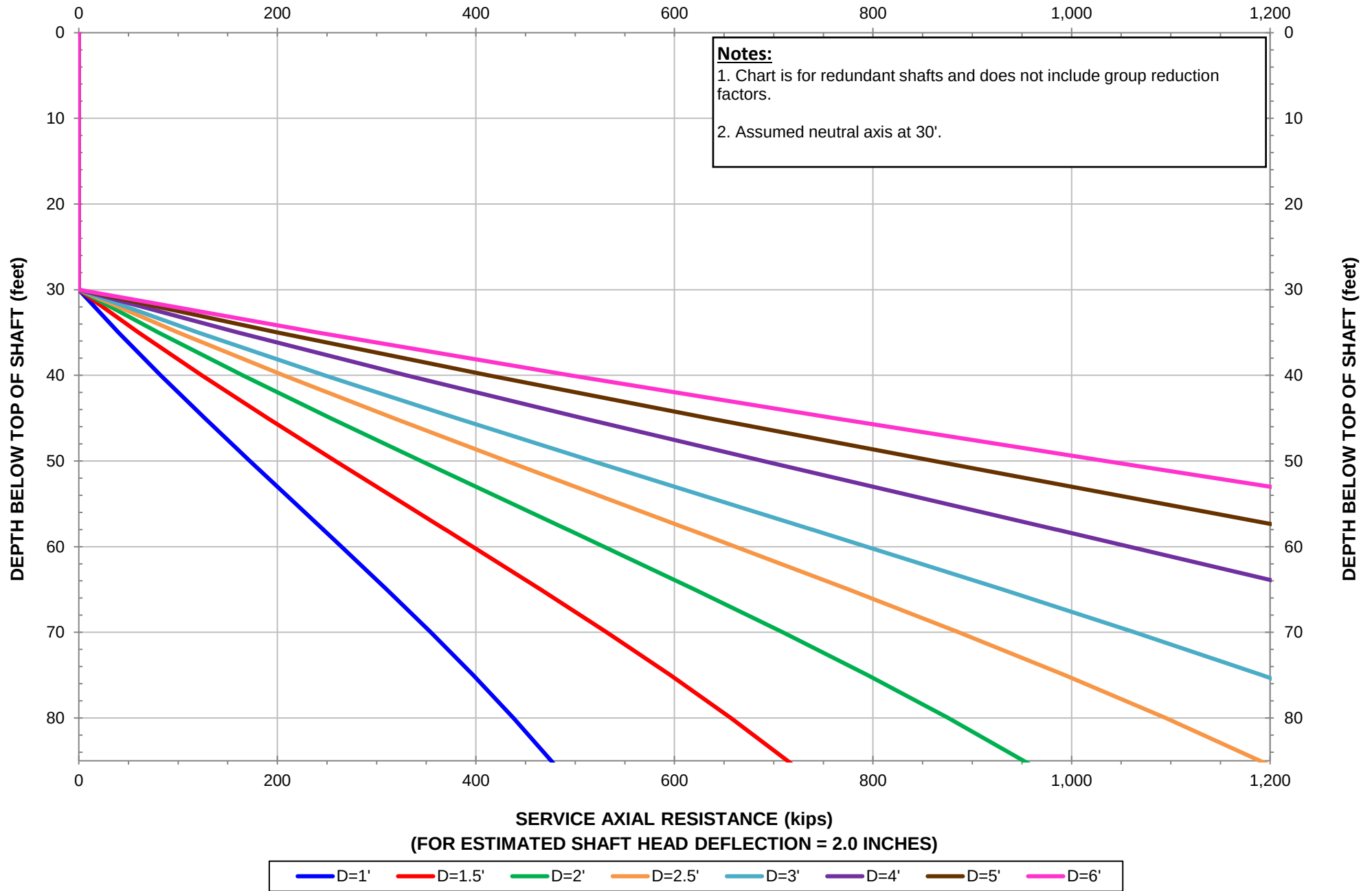
## RFTA GMF Phase 6: Admin Building - Service with Downdrag



Made By: RMP (Rev. 0)  
 Checked By: RAP  
 Approved By: RMP



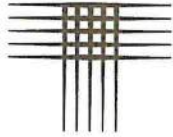
## RFTA GMF Phase 6: Admin Building - Service with Downdrag



Made By: RMP (Rev. 0)  
 Checked By: RAP  
 Approved By: RMP







# CTL | THOMPSON

Founded in 1971

## GEOLOGIC HAZARD EVALUATION

RFTA FACILITY EXPANSION  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, COLORADO

Prepared for:

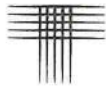
SAUNDERS, INC.  
86 Inverness Place North  
Englewood, CO 80112

Attention:  
Jennifer Renninger  
Assistant Project Manager

Project No. GS06668.000-115

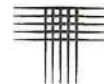
September 9, 2022

CTL|Thompson, Inc.  
Denver, Fort Collins, Colorado Springs, Glenwood Springs, Pueblo, Summit County – Colorado  
Cheyenne, Wyoming and Bozeman, Montana



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## SCOPE

This report presents the results of our Geologic Hazards Evaluation for the proposed development of the Roaring Fork Transit Authority (RFTA) Expansion Project at 2307 Wulfsohn Road in Glenwood Springs, Colorado. Our investigation was performed to identify geologic hazards present on the property. Our report includes descriptions of historic and current site conditions, site geology, and geologic hazards. We believe our report is in general conformance with our understanding of the intent of the Glenwood Springs City Code.

The report contains descriptions of mapped geology, site conditions observed during site reconnaissance, and geologic hazards. The report is based on review of available previous investigations, mapping, plans, site reconnaissance, and our understanding of proposed construction. If plans or grades change, this report and its contents may require revision; we should be made aware of design changes. Other types of construction may require revision of this report and the recommended design criteria.

## SITE CONDITIONS AND SITE HISTORY

The property is located at 2307 Wulfsohn Road in Glenwood Springs, Colorado. A RFTA facility is north of the site. A site visit was made on August 28<sup>th</sup> to observe current site conditions. A berm runs along the southern end of the site and is part of a catchment basin/debris pond system upslope of the property. The property sits on the western toe of a debris fan that originates from the north face of Red Mountain. The site slopes towards the north/northwest. The property is currently being used as a parking area. An aerial photograph of the site is shown on Photo 1.

The property was previously occupied by a Municipal Operations Center (MOC) that was owned by the City of Glenwood Springs. The structure was stepped into the natural slope of the site, with the upper (south) part of the building having one story and the northern part of the structure having a lower level with partial upper-level floor. We





believe site grades were achieved by minor cuts and fills. The structure experienced issues related to subsurface wetting and settlement and was ultimately deconstructed.

## PROPOSED CONSTRUCTION

The new building footprint is proposed on the benched area of the property that was graded after deconstruction of the MOC building. We understand the new RFTA building will be a one and two-story, steel-framed structure that will step-down to the north. The main level of the building will be used for bus parking. Preliminary plans indicate the structure is planned to be supported on drilled shafts with lengths on the order of 50 to 80 feet and diameters of 48 to 60 inches. Compaction grouting to greater depths is being considered. Keller NA is providing design-build services for the building foundation system.

To achieve proposed grades, excavations will be made into the berm running along the southern portion of the site. The excavation will be retained with a soil nail wall with reinforced shotcrete. A retaining wall will also be constructed downslope of the proposed structure. The downslope earth retention system will consist of a soil nail and reinforced shotcrete wall behind and below a GRS wall. The earth retention systems design and construction are the responsibility of GSI, the design-build subcontractor.

## PREVIOUS CTL|THOMPSON, INC. INVESTIGATIONS

CTL has performed numerous investigations of the RFTA property. The following reports were reviewed in preparation of this report:

- Geologic and Preliminary Geotechnical Investigation – Glenwood Meadows (Project No. GS-2871; report dated February 1, 2000)
- Geotechnical Investigation – Glenwood Springs Municipal Operations Center (MOC) (Project No. GS05594-125; report dated October 13, 2011)
- Geotechnical Engineering Investigation – RFTA Facility Expansion (Project No. GS06668.000-125; report dated February 14, 2022)



- Supplemental Geotechnical Engineering Investigation – RFTA Facility Expansion (Project No. GS06668.000-125; report dated April 6, 2022)
- Geotechnical Engineering Investigation – RFTA Facility Expansion (Project No. GS06668.000-125; report dated July 21, 2022)

## SITE GEOLOGY

According to the “Geologic Map of the Glenwood Springs Quadrangle, Garfield County, Colorado” (Kirkham, R.M., Streufert, R.K., Cappa, J.A., Shaw, C.A., Allen, J.L., and Jones, J.V., Colorado Geological Survey Map Series MS-38, 2008) and our borings within the property, the site is underlain by young debris flow deposits consisting of poorly-sorted boulder, cobble, pebble, and gravel in a fine-grained matrix. The Eagle Valley Evaporite underlies the debris flow deposits at greater depth. An excerpt from the 2008 map is reproduced below.

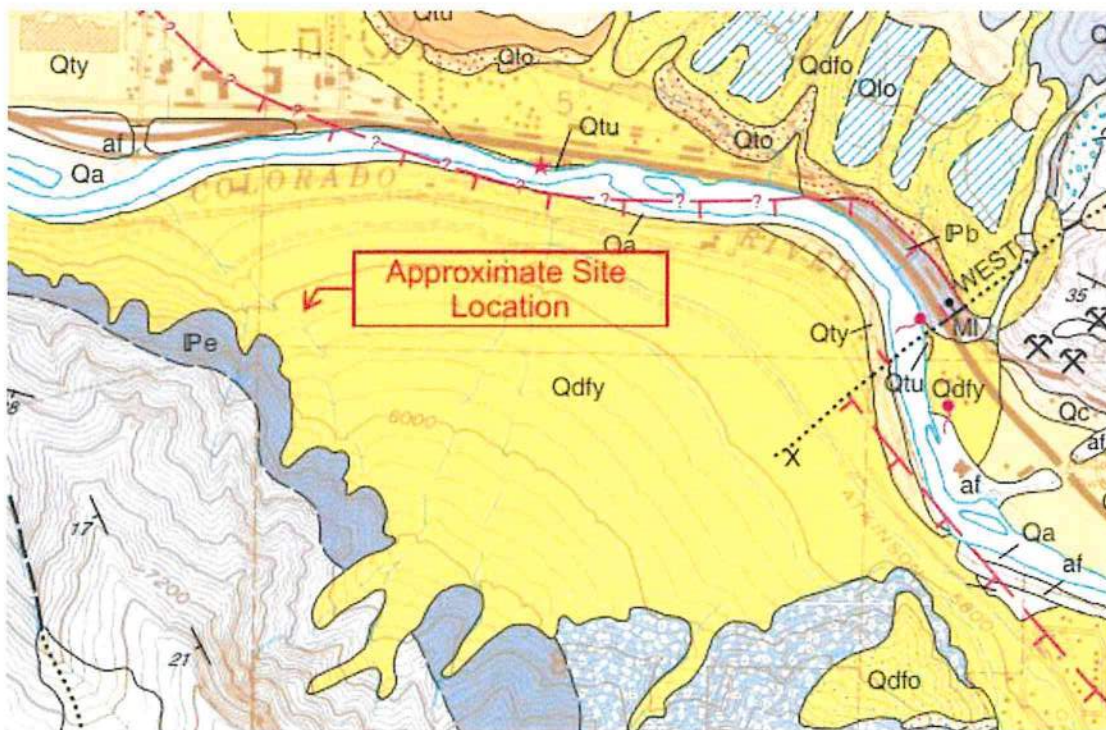
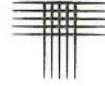


Figure 1 – Excerpt from the Geologic Map of the Glenwood Springs Quadrangle by Colorado Geological Survey, 2008. Approximate site location denoted by red arrow.





## **GEOLOGIC HAZARDS**

This section is intended to discuss geologic hazards present on the RFTA property and is based on field reconnaissance, review of published maps, review of provided documents, and our experience.

### **Hydrocollapsible Soils**

We reviewed Sheet 10 of the "General Geologic Hazards Map - Geologic Hazards of the Glenwood Springs Metropolitan Area, Garfield County, Colorado" prepared by Lincoln Devore Testing Laboratory in December 1977. Mapping indicates the RFTA property lies within a "zone of potential hydrocompaction and related settlement hazards" with a "severe hazard zone" rating.

The site is underlain by debris flow deposits consisting of unsorted and unstratified silt, clay, sand, gravel, cobbles, and occasional boulders to depths of at least 90 feet, as indicated by borings drilled during previous investigations. Debris flow deposits are susceptible to collapse when wetted. We understand the previous structure experienced settlement issues likely related to subsurface wetting. There is risk of hydrocollapsible soils on this site. The risk has been lowered to some degree by previous site development and associated increase in soil moisture content. It is critical that surface drainage be designed, constructed, and maintained to provide rapid removal of surface runoff. We believe the use of compaction grouting and drilled shafts for the proposed structure are positive approaches to improve support properties of the natural soils and reduce potential for differential movement of the building.

### **Debris Flows**

The property sits on the western toe of a debris fan. The fan is active and subject to periodic debris flows, mud flows, and alluvial events. The source basin for debris has reduced in size over the past several thousand years and the magnitude and frequency



of events has steadily decreased. A debris flow pond is present upslope of the site to the south. Per our review of the “Master Drainage Report for Glenwood Meadows” prepared by High Country Engineering (Project No. 2000031.000 X 316; report dated May 24, 2002), this pond was designed in conjunction with four other debris flow ponds throughout the fan to capture stormwater runoff and debris flows from contributing drainage basins, which will be released at a controlled rate through outfall structures.

At the time of our visit, there was evidence of recent deposition of finer grained material in the debris flow pond, with gravel being the approximate maximum particle size. The approximate thickness of deposition appeared to be on the order of about 1-foot. The bottom of the basin was moist at the time of our site visit; however it is difficult to discern if the material was recently deposited or if the moisture was related to a recent precipitation event. Site photos are presented below.

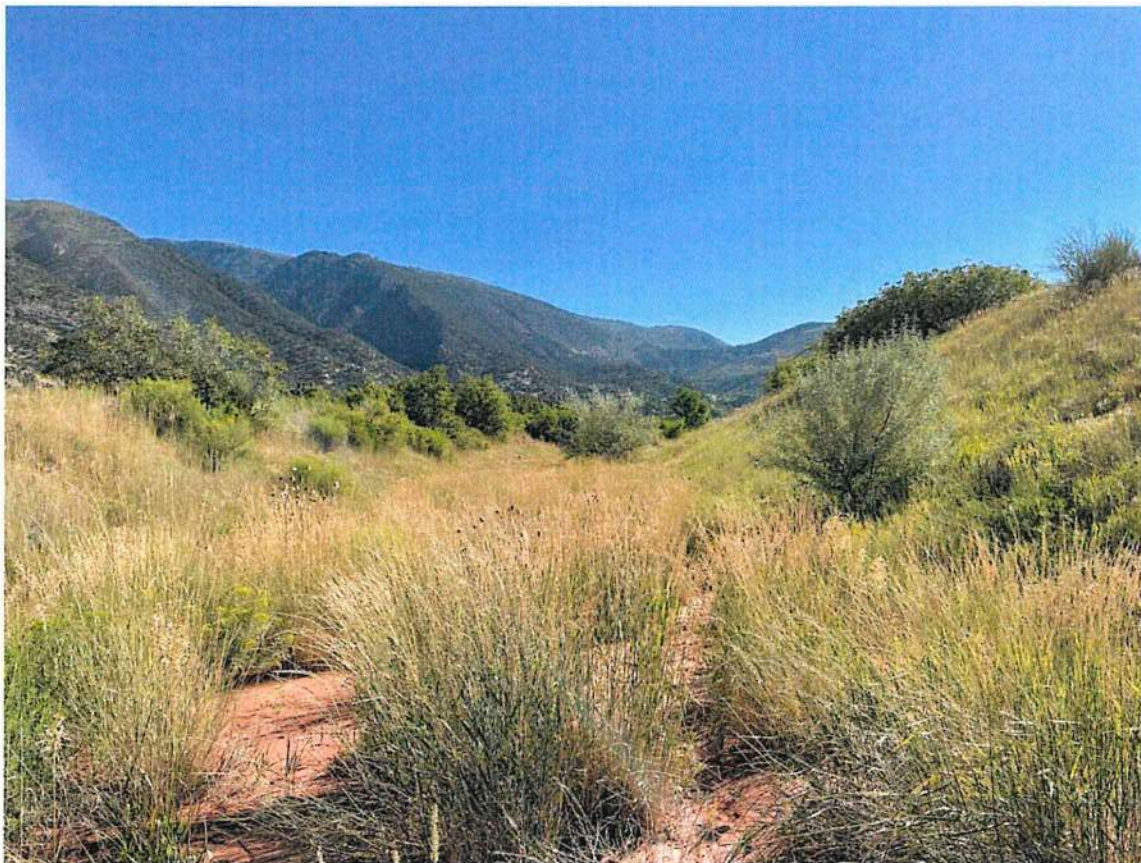


Photo 1: Debris flow pond, looking east. Photo obtained on August 28, 2022.



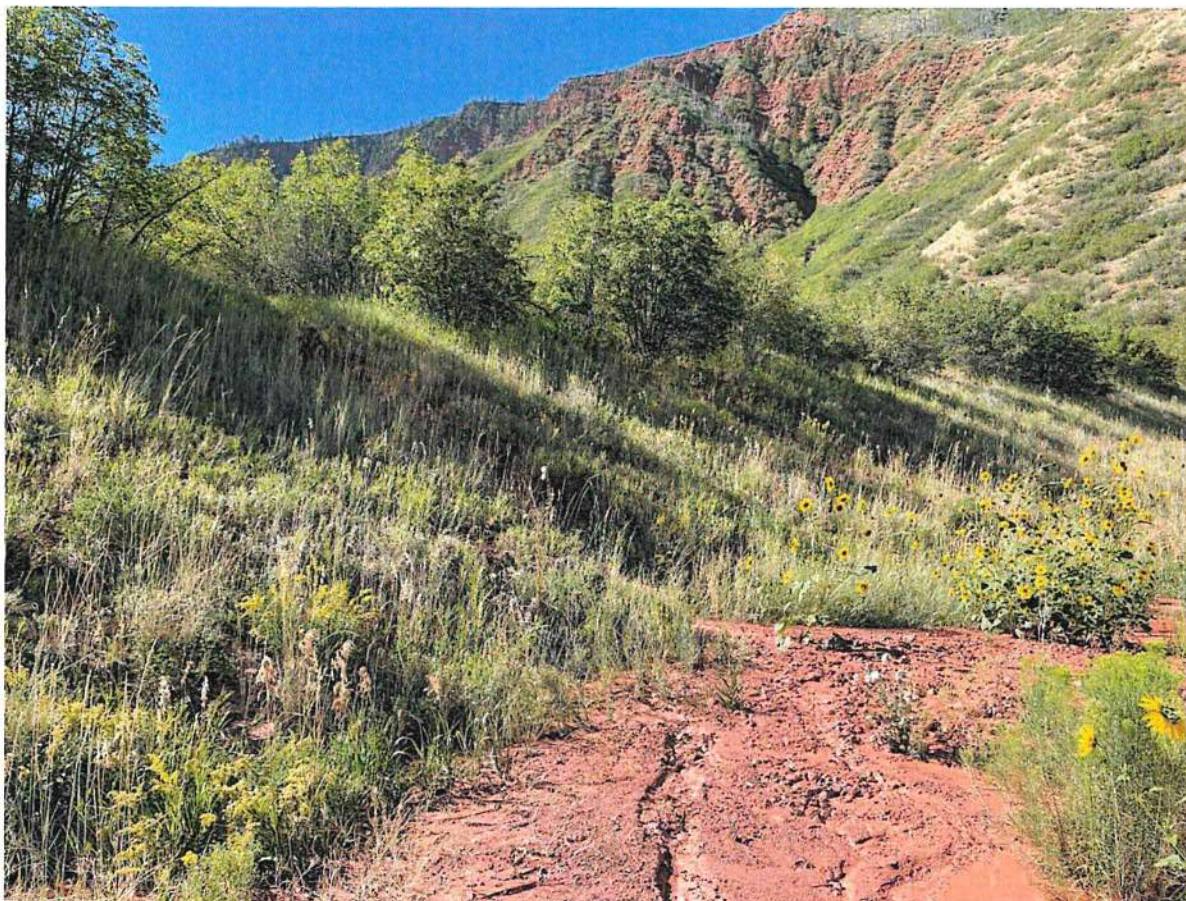
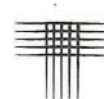


Photo 2: Debris flow pond, looking west/southwest. Photo obtained on August 28, 2022.

It appears that the debris flow pond is functioning as intended. We believe risk due to a significant debris flow event is low for the RFTA property considering the system of debris flow ponds present along the debris fan. It is critical the pond is routinely cleaned out to allow it to perform as designed.

We understand current plans include excavating into the northern side of the debris flow pond berm to allow for construction of drive lanes. The excavation will be permanently retained with a soil nail wall. Any modifications made to the debris flow pond should be evaluated to confirm it does not impact its intended design. The design volume of the basin should be taken into consideration during design of the southern retaining wall. All other criteria presented in the referenced Master Drainage Report should be considered in redevelopment of the RFTA property.





## **Rockfall**

We did not observe evidence of rockfall on the property. The mountaintops upslope from the site could be a source for rockfall, however the source material is relatively depleted and the topography of the slope above the site directs potential rockfall away from the property. We observed few boulders along the top of the southern slope of the debris flow pond, with sizes of about 1-foot by 1-foot. The boulders were covered in lichen with vegetation growing around them, indicating they did not recently fall. We do not believe rockfall poses a significant risk to the property.

## **Seismicity**

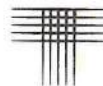
The RFTA property is located within the Western Mountain Seismotectonic Province. The West Glenwood Fault is mapped approximately 1-mile southwest of the subject site. There are several other faults that displace the Grand Hogback south of the site. These faults are considered active, however they are not considered likely to cause significant earthquakes.

Per the "Colorado Earthquake and Fault Map Server", the most recent recorded earthquake occurred on August 28, 2016 with a measured Modified Mercalli intensity V. Earthquakes of this intensity result in moderate shaking and may result in cracking of weak masonry structures. We believe ground accelerations associated with a modified intensity V earthquake can be expected at this site and structures should be designed accordingly.

## **GEOTECHNICAL RISK**

The concept of risk is an important aspect with any geotechnical evaluation primarily because the methods used to develop geotechnical recommendations do not comprise an exact science. We never have complete knowledge of subsurface conditions. Our analysis must be tempered with engineering judgment and experience.





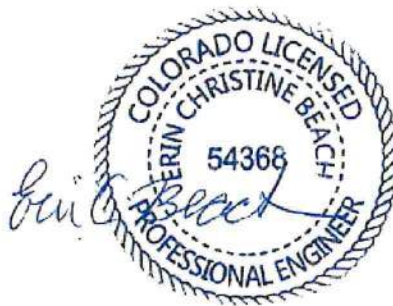
Therefore, the recommendations presented in any geotechnical evaluation should not be considered risk-free. Our recommendations represent our judgment of those measures that are necessary to increase the chances that the structures will perform satisfactorily. It is critical that all recommendations in this report are followed during construction.

## LIMITATIONS

We believe this investigation was conducted in a manner consistent with that level of care and skill ordinarily used by geotechnical engineers practicing in this area at this time. No warranty, express or implied, is made. If we can be of further service in discussing the contents of this report or analysis of the influence of subsurface conditions on the project, please call.

CTL | THOMPSON, INC.

Erin C. Beach, P.E., P.G.  
Geotechnical Project Manager



Reviewed by:

Erin Beach  
Sep 9 2022 2:19 PM  
John Mechling, P.E.  
Senior Principal Engineer

Via e-mail: [j.renninger@saundersinc.com](mailto:j.renninger@saundersinc.com)



## **Appendix D: Drainage Study**



Building a Better World  
for All of Us®

## MEMORANDUM

DATE: August 20, 2024

RE: West Glenwood Roaring Fork Transit Authority Bus Facility Improvements  
Planning Submittal Drainage Memorandum Phases 6A, 6B, and 8  
SEH No. ROFTA17800

### 1.0 Intent

The goal of this memorandum is to provide planning level drainage analysis for Phases 6A, 6B, and 8 of the West Glenwood Springs Bus Facility improvements project. This planning level memorandum will discuss conceptual drainage design and their compliance with the overall drainage plan for the site.

### 2.0 Background

The project site is located in Glenwood Springs, Colorado. The existing site along Wulfsohn Road includes a bus stop, bus parking, and a park and ride area. The proposed improvements will expand this existing area into a Bus Operations Facility for Roaring Fork Transit Authority (RFTA). SEH has been contracted to work on three phases of these improvements. Phase 6A is the Transit Center and will include a single building to be used as a transportation hub, bus pickup/dropoff areas, and parking. Phase 6A is located between Wulfsohn Road and Midland Avenue. Phase 6B is the Administration Building and associated parking located to the south of Wulfsohn Road. Phase 8 is Storage Building A located on the southwest corner of the Bus Operations Facility.



Site Location Map

Engineers | Architects | Planners | Scientists

Short Elliott Hendrickson Inc., 2000 South Colorado Boulevard, Suite 6000, Colorado Center Tower One, Denver, CO 80222-7938

SEH is 100% employee-owned | [sehinc.com](http://sehinc.com) | 720.540.6800 | 800.490.4966 | 888.908.8166 fax

### **3.0 Existing Condition**

The existing site is partially developed. Phases 6A and 6B have existing parking lots. Phase 8 is located on an area that is partially parking and partially undeveloped in the existing condition. The site is steep and generally flows to the northwest. The majority of the site drains to three ponds that are connected in series on the northwest portion of the property near the intersection of Wulfsohn Road and Midland Avenue.

The Phase 6A project site is approximately 5.00 acres with a total impervious value of 43.9%. The area generally flows over land to the west where it is collected in an existing pond. An Existing Drainage Map can be found attached to this memo.

The Phase 6B project site is approximately 1.85 acres with a total impervious value of 55.4%. The area generally flows over land to the west where it is collected in an existing area inlet and conveyed north via storm sewer to an existing pond. An Existing Drainage Map can be found attached to this memo.

Phase 8 is approximately 0.22 acres. With an impervious value of approximately 32.0%. Runoff from the area is conveyed overland to the west and then north via the existing storm system to an existing pond.

### **4.0 Existing Drainage Studies**

A Drainage Report for the RFTA Bus Operations Facility Improvements was completed by SGM in April of 2022. The study looked at the overall proposed site's impact on existing infrastructure including the existing ponds. This study was used as a reference to assess the affects the proposed improvements in Phases 6A, 6b, and 8 will have on the existing ponds and storm system. Excerpts from the Drainage Report can be found attached to this memo.

### **5.0 Criteria**

The drainage design criteria used for memorandum, and to be used in the proposed design of the site will be from Glenwood Springs Engineering Standards and Mile High Flood District Urban Storm Drainage Criteria Manual.

### **6.0 Proposed Design**

The proposed design of this site will look to use the existing infrastructure where possible to convey flows to the existing ponds on the northwest side of the site as laid out in the SGM Drainage Report.

#### **6.1 Phase 6A**

Phase 6A will have a proposed area of 4.93 acres and proposed impervious value of 66.5%. Runoff from the proposed site will be collected via curb and gutter and directed to inlets and conveyed to an underground water quality and detention facility via storm sewer. This underground storage facility will take the place of the existing pond. The facility will be sized to provide water quality treatment and flood attenuation for the majority of the proposed impervious area of the Phase 6A site. A Proposed Drainage Map can be found attached to this memo.

#### **6.2 Phase 6B**

Phase 6B will have a proposed area of 2.07 acres and proposed impervious value of 60.8%. Flows from phase 6B will be conveyed to a proposed inlet in the proposed parking lot and conveyed west via proposed storm sewer where it connects to the existing storm system. Flows will then be conveyed north to the existing pond.

### 6.3 Phase 8

Phase 8 is approximately 0.22 acres. With an impervious value of approximately 77.0%. Phase 8 will have minimal storm design. The proposed storage building will be located at the bottom of a steep slope. A swale will be constructed to divert runoff to the west where it will be collected by the existing storm system and conveyed to the north to the existing pond.

### 7.0 Conclusion

The final proposed design to be completed in future submittals will comply with design criteria laid out in the Glenwood Springs Engineering Standards and Mile High Flood District Urban Storm Drainage Criteria Manual. The proposed design will conform to the overall drainage plan laid out in SGM's Drainage Report.

Impervious area from Phase 6A will be conveyed to an underground storage facility which will provide water quality treatment and provide storage to allow for historic release rates.

Phase 6B will increase the existing impervious value from 55.4% to 60.8% while increasing the area from 1.85 acres to 2.07 acres. The proposed site will be less than the 69.2% imperviousness accounted for by the overall drainage plan. The site for Phase 6B lies mostly within basin 670 with a portion of basin 600 from SGM's Drainage Report. All of the Phase 6B site is accounted for in the report and directed to the existing pond. As the proposed site has lower impervious value than the pond was designed for, Phase 6B improvements will not negatively impact the existing pond.

The storage building in Phase 8 is accounted for in SGM's Drainage report. Storage Building A is shown in the RFTA Master Layout Exhibit within the Report and flows have been analyzed with the additional impervious area of this building are accounted for in the existing storm system and the existing pond and will therefore cause no adverse effects.

*Attachments: SGM's Report Excepts, Existing Drainage Basin Maps, Proposed Drainage Basin Maps*

## DRAINAGE REPORT

---

### RFTA BUS OPERATIONS FACILITY IMPROVEMENTS GLENWOOD SPRINGS, CO



April 2022

# For Review

04/11/2022 10:56:15 AM

Prepared by  
Ryan Stowe, E.I.

QAQC by  
Rick Barth, P.E. 0036749

Supervised by  
Jeff Simonson, P.E. 0026152



118 WEST 6TH, SUITE 200  
GLENWOOD SPRINGS, CO 81601  
970.945.1004



Figure 2 - RFTA Master Layout Exhibit

| BUILDINGS      | POR        | PROVIDED   |
|----------------|------------|------------|
| WAREHOUSE A    | 4,833 GSF  | 5,000 GSF  |
| WAREHOUSE B    | 6,200 GSF  | 6,200 GSF  |
| ADMIN BUILDING | 17,369 GSF | 17,369 GSF |

| PARKING          | POR           | PROVIDED |
|------------------|---------------|----------|
| EMPLOYEE         | 63 (75% = 47) | 47       |
| VISITOR & PARTON | 43            | 43       |
| DISABILITY       | 7             | 7        |
| NON-REV.         | 9             | 9        |
| TOTAL            | 125           | 106      |

TRAILER PARKING AT WAREHOUSES



Stantec Architecture Inc.  
999 18th Street, Suite 202  
Denver, 80202-2424  
Tel: (303) 295-1717 • www.stantec.com

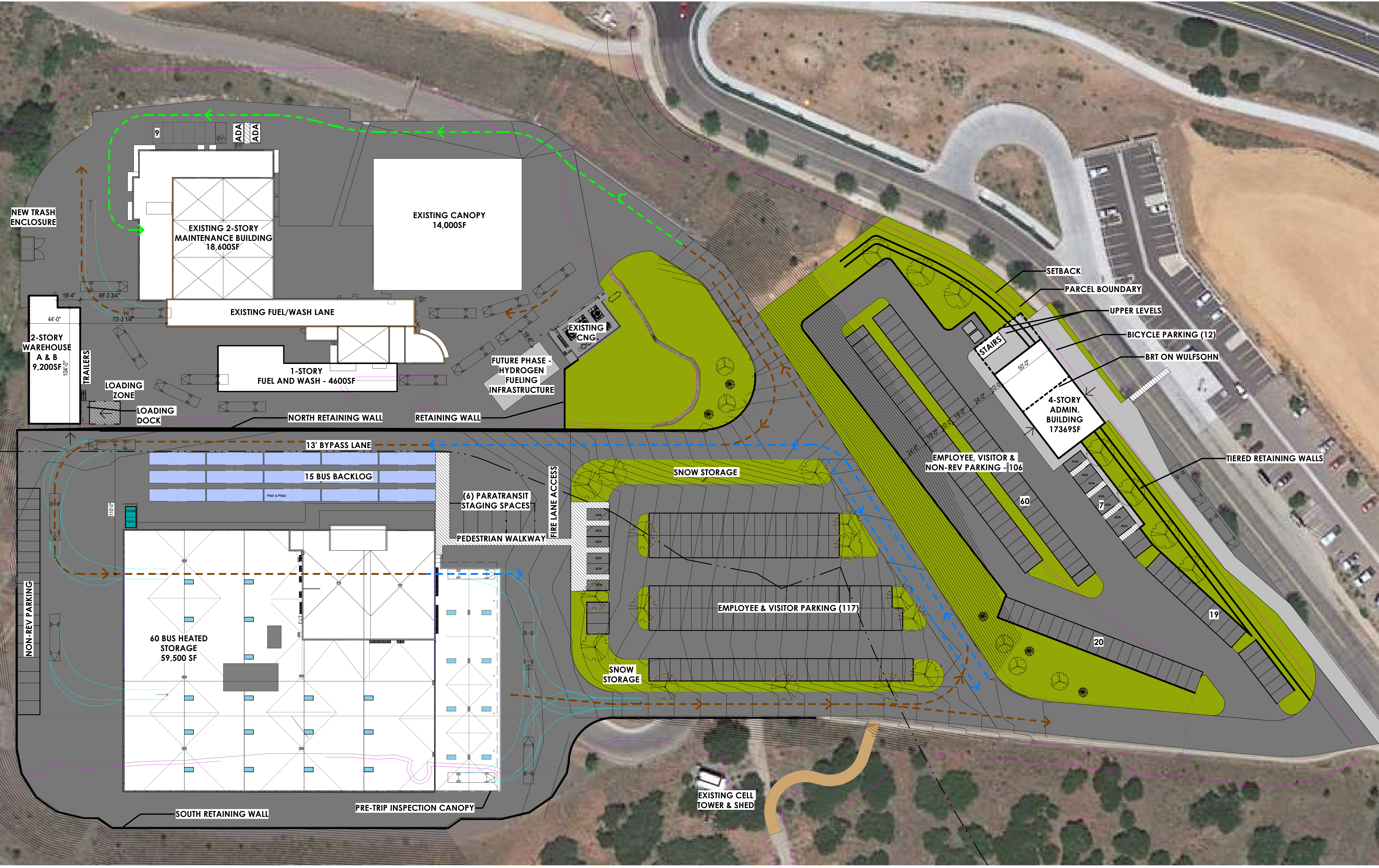
Copyright Reserved  
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.  
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.



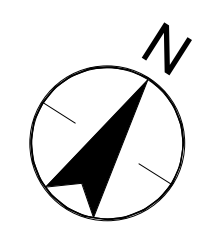
Consultants



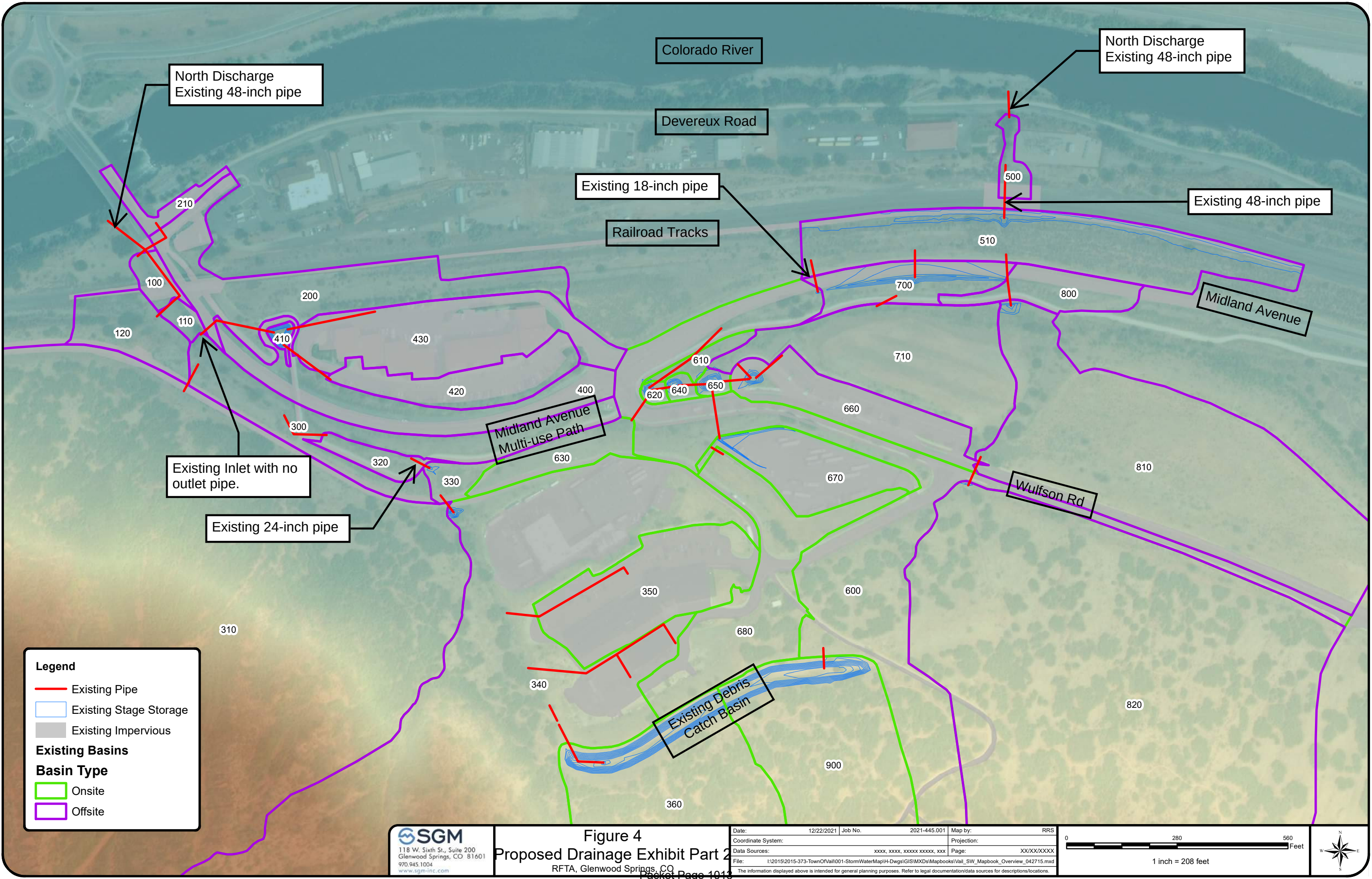
Legend



GLENWOOD SPRINGS  
MAINTENANCE FACILITY -  
BUS STORAGE & OPERATIONS  
2307 WULFSOHN RD.,  
GLENWOOD SPRINGS, CO 81601  
**NEXT STEPS  
CONCEPTUAL  
PLAN**







**Legend**

- Existing Pipe
- Existing Stage Storage
- Existing Impervious

**Existing Basins**

**Basin Type**

- Onsite
- Offsite

**SGM**  
118 W. Sixth St., Suite 200  
Glenwood Springs, CO 81601  
970.945.1004  
www.sgm-inc.com

**Figure 4**  
**Proposed Drainage Exhibit Part 2**  
RFTA, Glenwood Springs, CO  
Packet Page 1013

|                                                                                                                                                  |                                                                                                             |         |              |             |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------|--------------|-------------|------------|
| Date:                                                                                                                                            | 12/22/2021                                                                                                  | Job No. | 2021-445.001 | Map by:     | RRS        |
| Coordinate System:                                                                                                                               |                                                                                                             |         |              | Projection: |            |
| Data Sources:                                                                                                                                    | xxxx, xxxx, xxxxxx xxxxxx, xxx                                                                              |         |              | Page:       | XX/XX/XXXX |
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| The information displayed above is intended for general planning purposes. Refer to legal documentation/data sources for descriptions/locations. |                                                                                                             |         |              |             |            |

0 280 560 Feet

1 inch = 208 feet

**2021-445.001 Existing**

Prepared by SGM

HydroCAD® 10.10-6a s/n 10941 © 2020 HydroCAD Software Solutions LLC

*Type II 24-hr 25yr-24hr Rainfall=2.16"*

Printed 4/6/2022

Page 2

**Subcatchment500:** Runoff Area=0.259 ac 25.48% Impervious Runoff Depth>0.25"  
Tc=5.0 min CN=68 Runoff=0.09 cfs 0.005 af

**Subcatchment510:** Runoff Area=3.707 ac 15.94% Impervious Runoff Depth>0.16"  
Tc=5.0 min CN=64 Runoff=0.52 cfs 0.050 af

**Subcatchment600:** Runoff Area=8.420 ac 28.66% Impervious Runoff Depth>0.28"  
Tc=5.0 min CN=69 Runoff=3.34 cfs 0.194 af

**Subcatchment610:** Runoff Area=0.231 ac 3.03% Impervious Runoff Depth>0.08"  
Tc=5.0 min CN=59 Runoff=0.00 cfs 0.001 af

**Subcatchment620:** Runoff Area=0.078 ac 0.00% Impervious Runoff Depth>0.06"  
Tc=5.0 min CN=58 Runoff=0.00 cfs 0.000 af

**Subcatchment630:** Runoff Area=0.757 ac 16.25% Impervious Runoff Depth>0.16"  
Tc=5.0 min CN=64 Runoff=0.11 cfs 0.010 af

**Subcatchment640:** Runoff Area=0.106 ac 0.00% Impervious Runoff Depth>0.06"  
Tc=5.0 min CN=58 Runoff=0.00 cfs 0.001 af

**Subcatchment650:** Runoff Area=0.115 ac 0.87% Impervious Runoff Depth>0.06"  
Tc=5.0 min CN=58 Runoff=0.00 cfs 0.001 af

**Subcatchment660:** Runoff Area=1.533 ac 91.32% Impervious Runoff Depth>1.63"  
Tc=5.0 min CN=95 Runoff=4.35 cfs 0.209 af

**Subcatchment670:** Runoff Area=1.437 ac 88.66% Impervious Runoff Depth>1.46"  
Tc=5.0 min CN=93 Runoff=3.75 cfs 0.175 af

**Subcatchment680:** Runoff Area=2.882 ac 17.70% Impervious Runoff Depth>0.18"  
Tc=5.0 min CN=65 Runoff=0.53 cfs 0.043 af

**Subcatchment700:** Runoff Area=1.059 ac 47.40% Impervious Runoff Depth>0.54"  
Tc=5.0 min CN=77 Runoff=1.02 cfs 0.047 af

**Subcatchment710:** Runoff Area=3.271 ac 1.41% Impervious Runoff Depth>0.08"  
Tc=5.0 min CN=59 Runoff=0.04 cfs 0.021 af

**Subcatchment800:** Runoff Area=0.810 ac 45.56% Impervious Runoff Depth>0.50"  
Tc=5.0 min CN=76 Runoff=0.71 cfs 0.034 af

**Subcatchment810:** Runoff Area=8.130 ac 8.15% Impervious Runoff Depth>0.11"  
Tc=5.0 min CN=61 Runoff=0.32 cfs 0.072 af

**Subcatchment820:** Runoff Area=23.436 ac 1.05% Impervious Runoff Depth>0.06"  
Flow Length=1,968' Tc=16.1 min CN=58 Runoff=0.18 cfs 0.122 af

**Subcatchment900:** Runoff Area=6.007 ac 2.43% Impervious Runoff Depth>0.08"  
Tc=5.0 min CN=59 Runoff=0.07 cfs 0.038 af



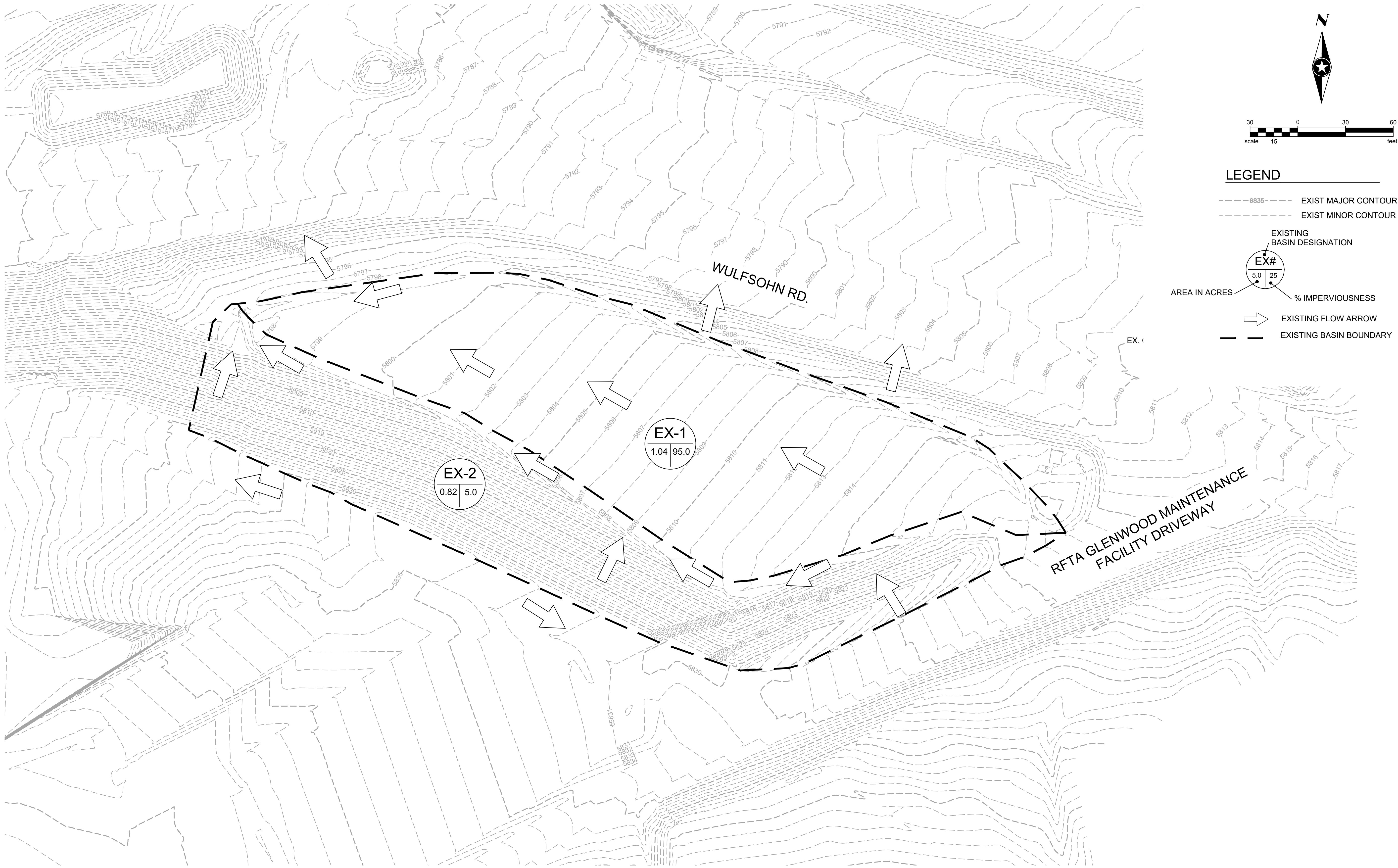
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| FIR Plans     |  | EXISTING DRAINAGE MAP<br>PHASE 6B |                   |    | Project No./Code |
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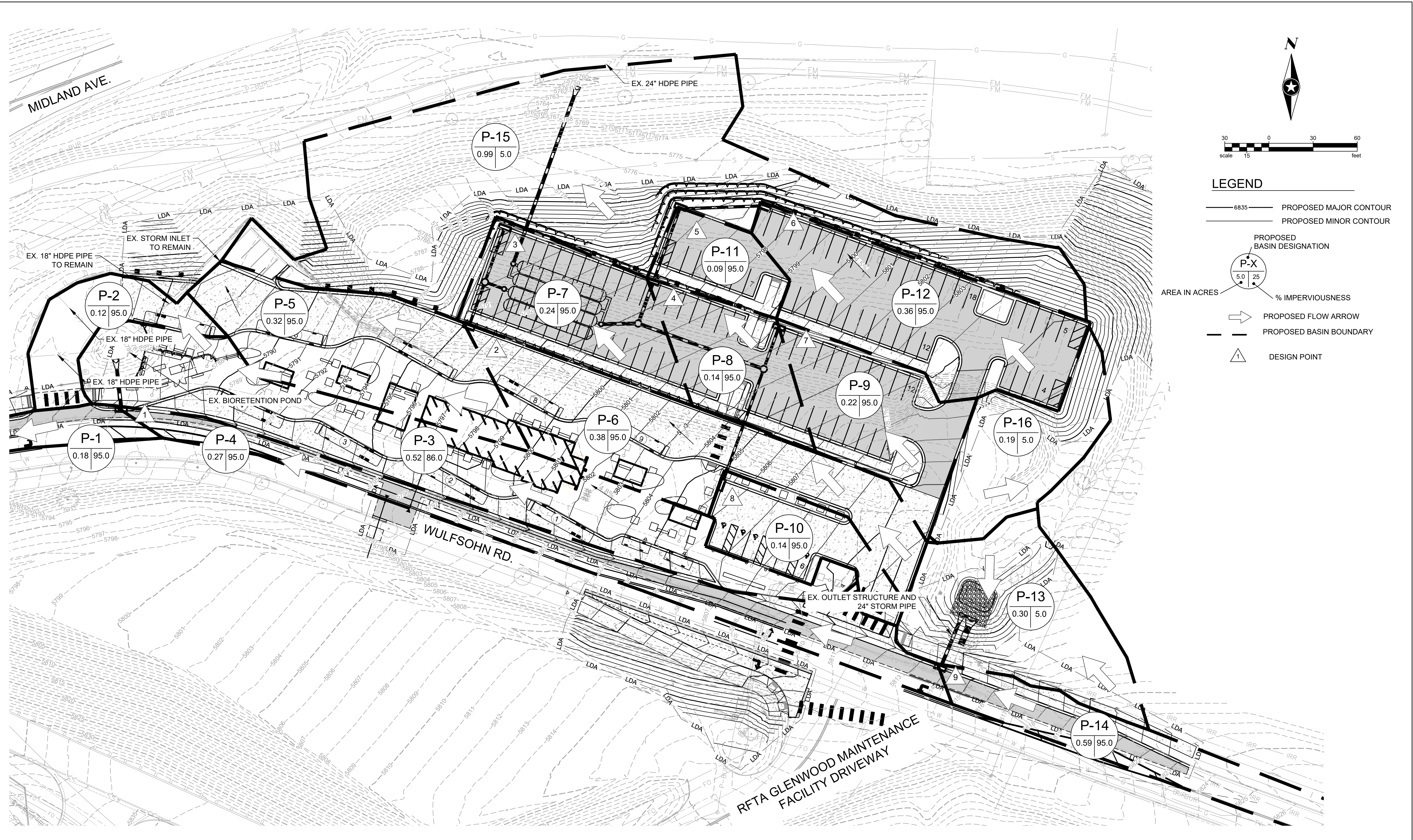
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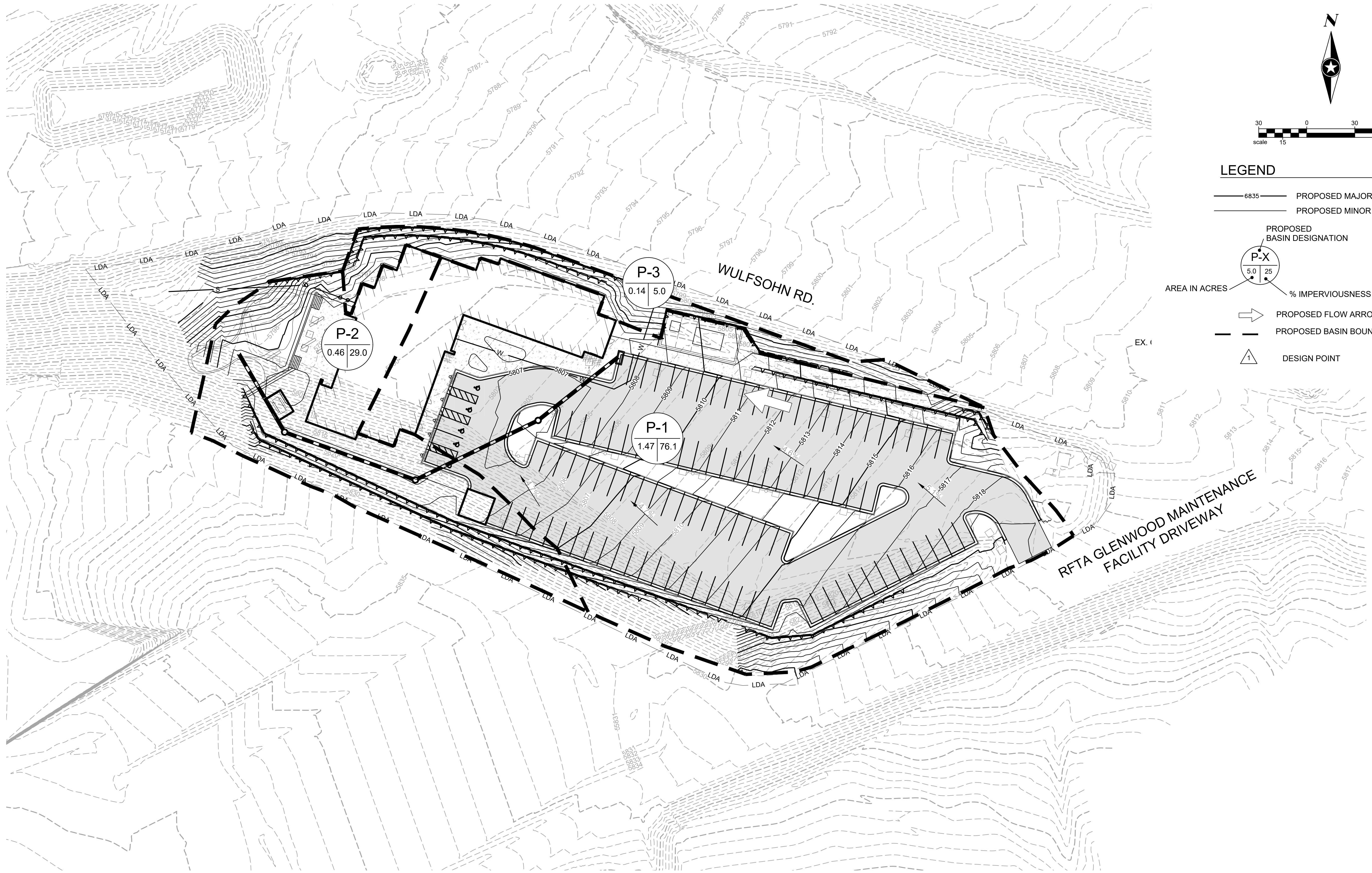
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PROPOSED MINOR CONTOUR

PROPOSED BASIN DESIGNATION

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PROPOSED FLOW ARROW

PROPOSED BASIN BOUNDARY

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DESIGN POINT

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ROARING FORK TRANSPORTATION AUTHORITY

WEST GLENWOOD TRANSIT CENTER

AND ADMINISTRATION OFFICES

2307 WULFSOHN ROAD

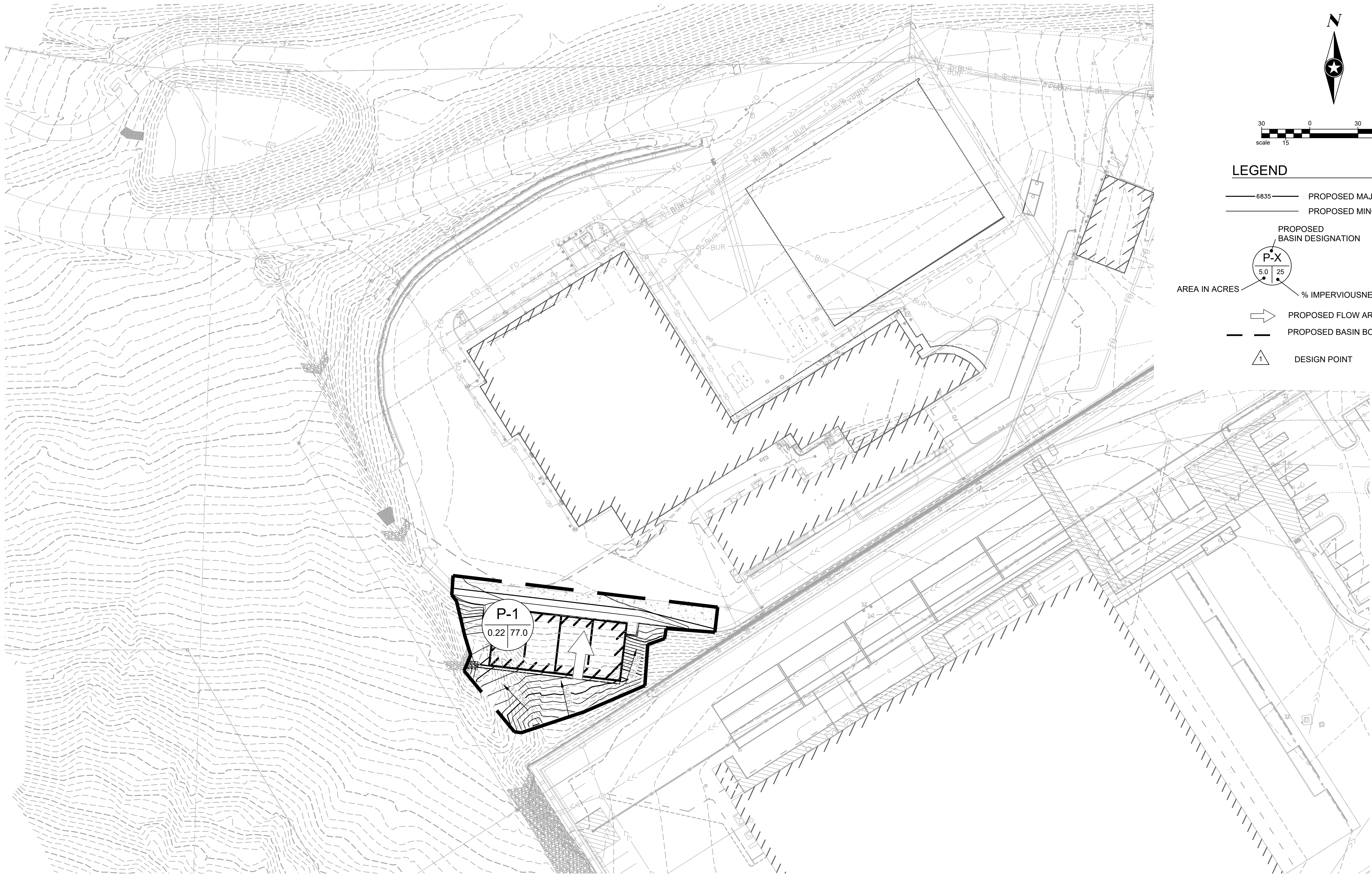
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|  | Short Elliott Hendrickson Inc. |                      |          |
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|                                                                                     | Suite 6000                     |                      |          |
|                                                                                     | 2000 South Colorado Boulevard  |                      |          |
| Denver, CO 80222-7900                                                               |                                | Tele. (720) 540-6800 |          |
|                                                                                     |                                | (800) 490-4966       |          |
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GLENWOOD SPRINGS, CO 81601

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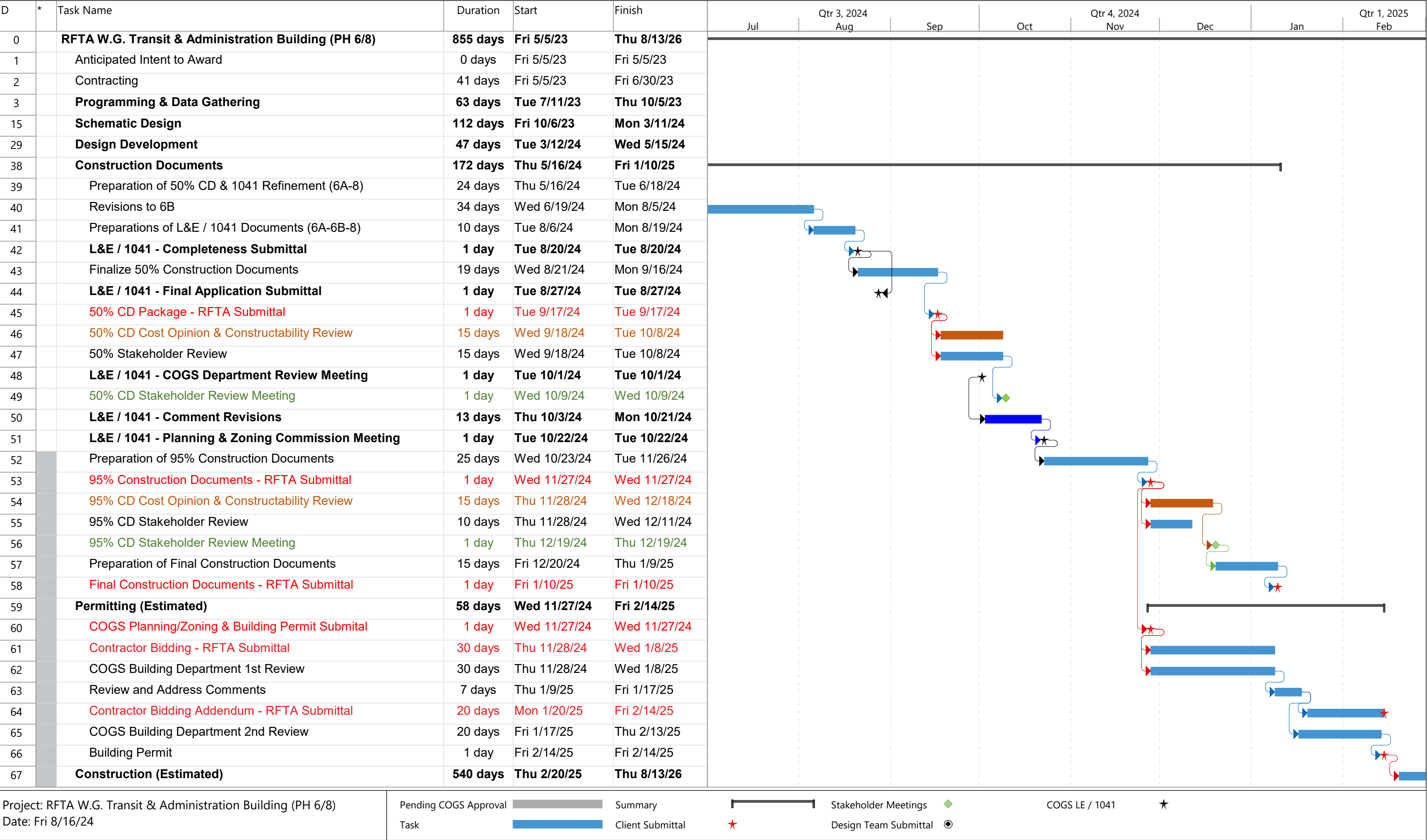
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## **Appendix E: Project Timeline**

Total Project Duration = 855 days (Calendar)

RFTA West Glenwood Transit-Administration Building PH-6/8  
Project Schedule



## **Appendix F: Written Authorization & Statement Regarding Mineral Owners & Lessees**





0051 Service Center Road  
Aspen, Colorado 81611

970.925.8484 |

To Whom it May Concern,

Short Elliot Hendrickson Inc. (S.E.H.) and DHM Design are authorized to represent the Roaring Fork Transportation Authority for the L&E and 1041 application of the West Glenwood Transit Center, RFTA Administration and Operations Building, and the Glenwood Maintenance Facility Storage building located at 2307 Wulfsohn Rd. in Glenwood Springs, CO

**Ben Ludlow**

**Roaring Fork Transportation Authority**

**Capital Projects Program Manager**



0051 Service Center Road  
Aspen, Colorado 81611

970.925.8484 |

To Whom it May Concern,

RFTA has examined the records of the County Clerk and Recorder for the existence of any mineral estate owners or lessees, and no such mineral estate owners or lessees exist at 2307 Wulfsohn Rd. in Glenwood Springs, CO.

**Ben Ludlow**

**Roaring Fork Transportation Authority**

**Capital Projects Program Manager**

## **Appendix G: Archeological Resources**



Consultants in Natural Resources and the Environment

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# Technical Memorandum

## File and Literature Review for Archaeological Resources

### Glenwood Maintenance Facility, Phases 6A, 6B, and 8

### Garfield County, Colorado

*Prepared for—*

*Roaring Fork Transportation Authority*

*July 3, 2024*

On behalf of the Roaring Fork Transportation Authority (RFTA), ERO Resources Corporation (ERO) conducted an archaeological file review for the proposed Glenwood Maintenance Facility (project). The project involves expansion of the existing maintenance facility located near the Wulfsohn Road and Midland Avenue intersection on the north side of Glenwood Springs in Garfield County, Colorado. Because RFTA is using a grant from the Federal Transit Administration (FTA), the project requires reviews under the National Environmental Policy Act and must consider potential effects on archaeological resources pursuant to Section 106 (54 United States Code [U.S.C.] § 306108) of the National Historic Preservation Act (NHPA, 1966, as amended; 54 U.S.C. § 300101 et seq.). The Colorado Department of Transportation is coordinating the Section 106 compliance process on behalf of the FTA. ERO conducted a file search and literature review to identify known or potential archaeological resources that may be impacted by the project.

## **Project Description**

RFTA proposes to renovate and expand its current maintenance facility into a new centrally located operations, maintenance, and administrative center called the Regional Transit Center (RTC). The RTC will function as the main regional transit center for RFTA. The RTC will address RFTA's current operational deficiencies and accommodate forecasted growth in population, employment, and ridership demand in RFTA's three-county service area. The RTC will provide sufficient bus storage, operations, maintenance, and administrative capacity and capability to support RFTA's long-term vision of creating greater connectivity between local, regional, and statewide transit systems. The RTC project includes 10 phases (Table 1). This technical memorandum addresses Section 106 compliance needs for Phases 6A, 6B, and 8.

**Table 1. Project phases.**

| Phase | Scope                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Lowering and grading the existing grade and construction of a temporary bus parking lot (for maintaining operations during future phases).                                                                                                   |
| 2     | Additional grading and excavation and renovation and expansion of a fleet maintenance building.                                                                                                                                              |
| 3     | Demolition, grading, excavation, and site preparation. Construction of a new Operations Center, Bus Storage Building A (with 30 indoor bus storage spaces), pre-trip bus inspection zones, bus backlog parking, and Maintenance Warehouse A. |
| 4     | Glenwood Maintenance Facility Administration building renovation. Relocate access road.                                                                                                                                                      |
| 5     | Construction of Bus Building 30B, associated drives, and pre-trip bus inspection zones.                                                                                                                                                      |
| 6     | <b>Construction of RFTA Transit Center (6A) and Administration Building (6B) with associated drives and parking area.</b>                                                                                                                    |
| 7     | Construction of bus fueling drive lanes and a bus wash area.                                                                                                                                                                                 |
| 8     | <b>Construction of Warehouse B, associated drives, and parking area.</b>                                                                                                                                                                     |
| 9     | Construction of RFTA Housing Phase 1 with associated drives and parking.                                                                                                                                                                     |
| 10    | Construction of RFTA Housing Phase 2 with associated drives and parking.                                                                                                                                                                     |

## Project Area

The project area includes all areas of potential ground disturbance for the project including construction staging and access (8.43 acres). The project area overlaps existing roads and areas of previous disturbance. The legal location is the southwest quarter of Section 5 and the southwest quarter of Section 6, Township 6 South, Range 89 West of the 6<sup>th</sup> Principal Meridian in Garfield County, Colorado (Figure 1 and Figure 2, attached).

## Methodology

The purpose of the cultural resource file and literature review is to determine if any previously documented cultural resources listed in or eligible for listing in the National Register of Historic Places (NRHP) or State Register of Historic Places (SRHP) could be impacted by the proposed project. A “cultural resource” is defined as an archaeological site, structure, or building constructed 50 or more years ago (Little et al. 2000). For this project, a 45-year age criterion was used as a buffer in the event the project is delayed after Section 106 consultation is completed. This review is focused on archaeological sites. A cultural resource listed in or eligible for listing in the NRHP/SRHP is a “historic property.” To assist with project planning and potential consultation obligations under Section 106 of the NHPA (36 Code of Federal Regulations 800) and the State Register Act, Colorado Revised Statutes 34-80.1-104, ERO reviewed the previous cultural resource surveys and resource documentation completed in the project area and a 0.5-mile buffer by conducting a file search with the Office of Archaeology and Historic Preservation (OAHP). The OAHP provided the results to ERO on June 7, 2024 (File Search No. 26272) (Figure 3, attached).

## Results

The file search identified eight previously conducted cultural resource surveys that intersect the file search area (Table 2). Of these, two surveys intersect the project area (GF.CH.R5 and MC.PA.R78). Survey MC.PA.R78 covers the entire project area.

**Table 2. Previous cultural inventories within the project area and 0.5-mile buffered file search area.**

| Survey ID   | Report Title (Date)                                                                                                                                                                                                                | Institution                                                   |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| DT.LM.NR187 | <i>A Class III Cultural Resource Inventory of the Proposed Salinity Soil Stability Project (BLM#: 22UN-24) (2022)</i>                                                                                                              | Bureau of Land Management (BLM)<br>- Uncompahgre Field Office |
| GF.CH.R5    | <i>Glenwood Springs Alternative Transportation Route Cultural Resource Inventory, Garfield County, Colorado (Original and Addendum) (2006)</i>                                                                                     | Metcalf Archaeological Consultants                            |
| GF.EP.R1    | <i>Cultural Resource Inventory for the Glenwood Springs 201 Facility Plan, City of Glenwood Springs, Garfield County, Colorado (2003)</i>                                                                                          | Metcalf Archaeological Consultants                            |
| GF.LM.NR593 | <i>Chatfield Ranch Right of Way, A Class III Cultural Resource Inventory in Garfield County, Colorado S#5400-8 (2003)</i>                                                                                                          | Metcalf Archaeological Consultants                            |
| MC.CH.R94   | <i>A Class III Cultural Resources Survey of the Roaring Fork Railroad Authority Environmental Impact Statement, Glenwood Springs to Brush Creek Transportation Corridor, Eagle, Garfield, and Pitkin Counties, Colorado (2008)</i> | Western Cultural Resource Management, Inc.                    |
| MC.CH.R96   | <i>A Cultural Resource Survey of Interstates 25, 70, 225, and 270, U.S. Highways 34 and 160, and State Highways 13 and 470, for the Proposed Adesta Communications Fiber Optic System, Colorado (C SW00-102) (2008)</i>            | Centennial Archaeology, Inc.                                  |
| MC.LM.R639  | <i>Class III Cultural Resource Inventory Public Service Company of Colorado, Palisade to Shoshone Transmission Line, Garfield and Mesa Counties, Colorado (BLM # CRIR 15911-04) (2012)</i>                                         | BLM Grand Junction Field Office                               |
| MC.PA.R78   | <i>Class III Cultural Resources Survey for the Roaring Fork Transportation Authority Bus Rapid Transit Project Along Colorado State Highway 82, Garfield, Eagle, and Pitkin Counties, Colorado (2010)</i>                          | FTA                                                           |

The OAHP records indicate seven previously documented historical resources are located within the 0.5-mile buffer file search area (see *Technical Memorandum, File and Literature Review for Historical Resources Glenwood Maintenance Facility, Phases 6A, 6B, and 8, Garfield County, Colorado*). No previously documented archaeological resources intersect the file search area.

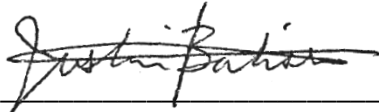
In addition to the OAHP file search, ERO reviewed historical maps (General Land Office 1885; U.S. Geological Survey 1930, 1963, 1968) and imagery to determine if historical archaeological sites may have been previously located in the project area. Maps do not indicate the presence of any potential archaeological resources in the project area. Aerial imagery shows that nearly the entire project area was disturbed by the construction of Wulfsohn Road, the parking lots, and utilities from 2002 to 2023 (Google, Inc. 2024). Approximately two small areas totaling 0.03 acre appear to remain intact along the east side of the project area. Trees that predate construction activities remain standing in these areas.



## Summary

The file search was conducted with a 0.5-mile buffer around the project area. No archaeological resources have been previously documented in the file search area. The project area was completely surveyed in 2010 (MC.PA.R78). The project area has been thoroughly disturbed by construction activities related to the facility; 0.03 acre or less (less than 1 percent) of land appears not to have been disturbed. Therefore, a cultural resource survey is unlikely to identify any additional archaeological resources in the project area.

## Certification of Results



Justin Batista, Project Archaeologist

## Attachments

Figure 1. Project Location (USGS 1:24,000 topographic quadrangle)

Figure 2. Project Location (Aerial imagery)

Figure 3. File Search Results

## References Cited

### General Land Office

1885 Original Survey Plat, Township 6 South Range 89 West. Electronic database, <https://glorerecords.blm.gov/results/>, accessed June 25, 2024.

### Google, Inc.

2024 Google Earth Pro. *Google Earth Pro version 7.3.3.7786 (64-bit)*. Online database, <https://earth.google.com/web>.

### Little, Barbara, Erika M. Seibert, Jan Townsend, John H. Sprinkle Jr., and John Knoerl

2000 *National Register Bulletin: Guidelines for Evaluating and Registering Archaeological Properties*. Prepared by the U.S. Department of the Interior.

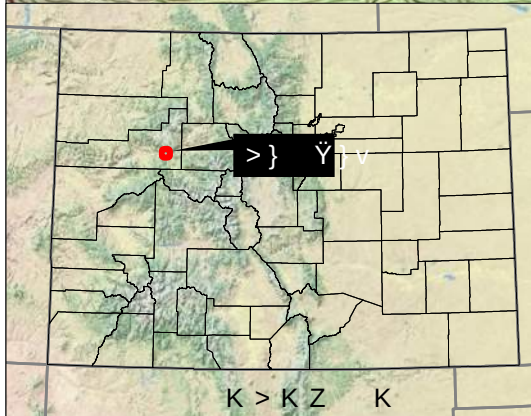
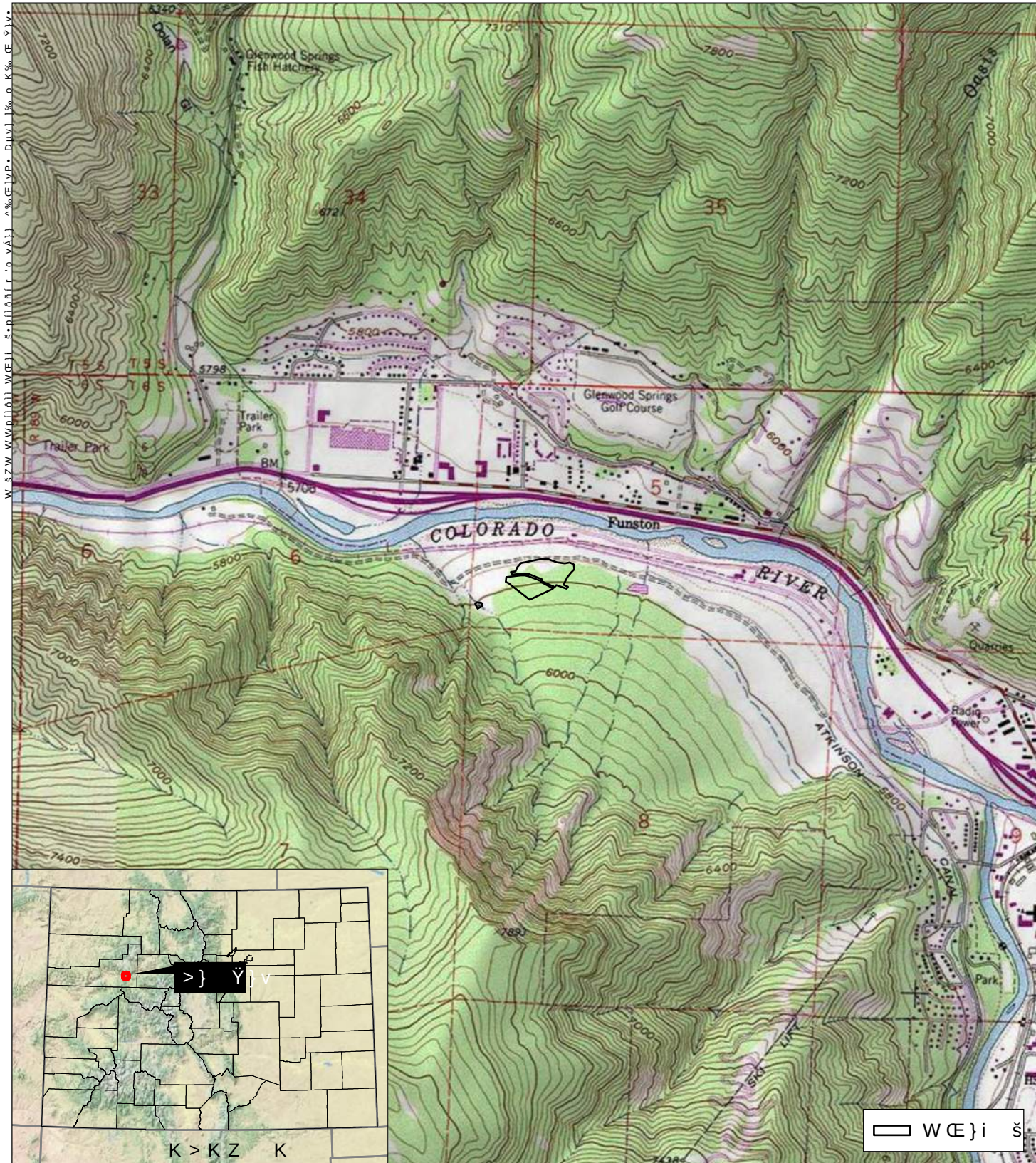
### U.S. Geological Survey

1930 Glenwood Springs, Colorado. Topographic Map. 1:125,000. U.S. Geological Survey, Denver, Colorado.

1963 Glenwood Springs, Colorado. Topographic Map. 1:24,000. U.S. Geological Survey, Denver, Colorado.

1968 Glenwood Springs, Colorado. Topographic Map. 1:24,000. U.S. Geological Survey, Denver, Colorado.





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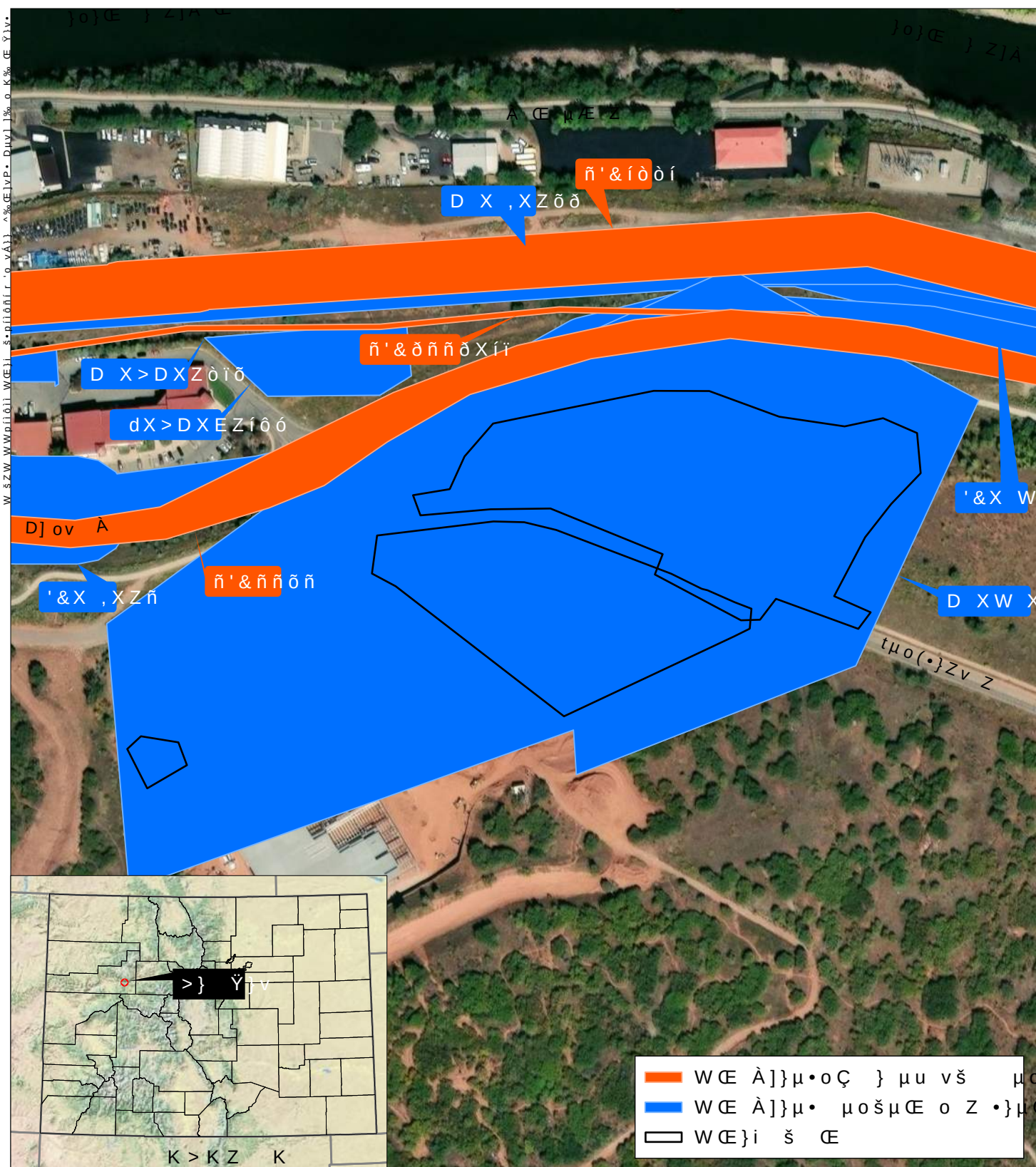
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## **Appendix H: Historical Resources**



Consultants in Natural Resources and the Environment

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# Technical Memorandum

## File and Literature Review for Historical Resources

### Glenwood Maintenance Facility, Phases 6A, 6B, and 8

### Garfield County, Colorado

*Prepared for—*

*Roaring Fork Transportation Authority*

*July 3, 2024*

On behalf of the Roaring Fork Transportation Authority (RFTA), ERO Resources Corporation (ERO) conducted a historic file review for the proposed Glenwood Maintenance Facility (project). The project involves expansion of the existing maintenance facility located near the Wulfsohn Road and Midland Avenue intersection on the north side of Glenwood Springs in Garfield County, Colorado. Because RFTA is using a grant from the Federal Transit Administration (FTA), the project requires reviews under the National Environmental Policy Act and must consider potential effects on historical resources pursuant to Section 106 (54 United States Code [U.S.C.] § 306108) of the National Historic Preservation Act (NHPA, 1966, as amended; 54 U.S.C. § 300101 et seq.). The Colorado Department of Transportation (CDOT) is coordinating the Section 106 compliance process on behalf of the FTA. ERO conducted a file search and literature review to identify known or potential historical resources that may be impacted by the project.

## **Project Description**

RFTA proposes to renovate and expand its current maintenance facility into a new centrally located operations, maintenance, and administrative center called the Regional Transit Center (RTC). The RTC will function as the main regional transit center for RFTA. The RTC will address RFTA's current operational deficiencies and accommodate forecasted growth in population, employment, and ridership demand in RFTA's three-county service area. The RTC will provide sufficient bus storage, operations, maintenance, and administrative capacity and capability to support RFTA's long-term vision of creating greater connectivity between local, regional, and statewide transit systems. The RTC project includes 10 phases (Table 1). This technical memorandum addresses Section 106 compliance needs for Phases 6A, 6B, and 8. See the attached *Design Plans* for additional details on the proposed work for Phases 6A, 6B, and 8.



**Table 1. Project phases.**

| Phase | Scope                                                                                                                                                                                                                                        |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Lowering and grading the existing grade and the construction of a temporary bus parking lot (for maintaining operations during future phases).                                                                                               |
| 2     | Additional grading and excavation and renovation and expansion of a fleet maintenance building.                                                                                                                                              |
| 3     | Demolition, grading, excavation, and site preparation. Construction of a new Operations Center, Bus Storage Building A (with 30 indoor bus storage spaces), pre-trip bus inspection zones, bus backlog parking, and Maintenance Warehouse A. |
| 4     | Glenwood Maintenance Facility Administration building renovation. Relocate access road.                                                                                                                                                      |
| 5     | Construction of Bus Building 30B, associated drives, and pre-trip bus inspection zones.                                                                                                                                                      |
| 6     | <b>Construction of RFTA Transit Center (6A) and Administration Building (6B) with associated drives and parking area.</b>                                                                                                                    |
| 7     | Construction of bus fueling drive lanes and a bus wash area.                                                                                                                                                                                 |
| 8     | <b>Construction of Warehouse B, associated drives, and parking area.</b>                                                                                                                                                                     |
| 9     | Construction of RFTA Housing Phase 1 with associated drives and parking.                                                                                                                                                                     |
| 10    | Construction of RFTA Housing Phase 2 with associated drives and parking.                                                                                                                                                                     |

## Area of Potential Effects

The area of potential effects (APE) incorporates the project area where all potential ground disturbance may take place including construction staging and access may occur. Because the project proposes to expand an existing facility, the APE also accommodates possible visual impacts by incorporating a 500-foot buffer around the project area that intersects all adjacent parcels (69.54 acres). The legal location is Sections 5 through 8, Township 6 South; Range 89 West of the 6<sup>th</sup> Principal Meridian in Garfield County, Colorado (Figure 1 and Figure 2, attached).

## Methodology

The purpose of the cultural resource file and literature review is to determine if any previously documented cultural resources listed in or eligible for listing in the National Register of Historic Places (NRHP) or State Register of Historic Places (SRHP) could be impacted by the proposed project. A “cultural resource” is defined as an archaeological site, structure, or building constructed 50 or more years ago (Little et al. 2000). For this project, a 45-year age criterion was used as a buffer in the event the project is delayed after Section 106 consultation is completed. This review is focused on cultural resources that are part of the built environment rather than archaeological sites. A cultural resource listed in or eligible for listing in the NRHP/SRHP is a “historic property.” To assist with project planning and potential consultation obligations under Section 106 of the NHPA (36 Code of Federal Regulations [CFR] 800) and the State Register Act, Colorado Revised Statutes 34-80.1-104, ERO reviewed the previous cultural resource surveys and resource documentation completed in the APE and a 0.5-mile buffer by conducting a file search with the Office of Archaeology and Historic Preservation (OAHP). The OAHP provided the results to ERO on June 7, 2024 (File Search No. 26272).

## Results

The file search identified eight previously conducted cultural resource surveys that intersect the 0.5-mile buffer surrounding the search area (Table 2). Of these, six surveys intersect the APE (DT.LM.NR187, GF.CH.R5, GF.EP.R1, MC.CH.R94, MC.LM.R639, and MC.PA.R78).

**Table 2. Previous cultural inventories within the 0.5-mile buffered file search area.**

| Survey ID   | Report Title (Date)                                                                                                                                                                                                                | Institution                                                      | Intersect the APE? |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------|
| DT.LM.NR187 | <i>A Class III Cultural Resource Inventory of the Proposed Salinity Soil Stability Project</i> (BLM#: 22UN-24)                                                                                                                     | Bureau of Land Management (BLM) - Uncompahgre Field Office (UFO) | Yes                |
| GF.CH.R5    | <i>Glenwood Springs Alternative Transportation Route Cultural Resource Inventory, Garfield County, Colorado (Original and Addendum)</i> (2006)                                                                                     | Metcalf Archaeological Consultants                               | Yes                |
| GF.EP.R1    | <i>Cultural Resource Inventory for the Glenwood Springs 201 Facility Plan, City of Glenwood Springs, Garfield County, Colorado</i> (2003)                                                                                          | Metcalf Archaeological Consultants                               | Yes                |
| GF.LM.NR593 | <i>Chatfield Ranch Right of Way, A Class III Cultural Resource Inventory in Garfield County, Colorado S#5400-8</i> (2003)                                                                                                          | Metcalf Archaeological Consultants                               | No                 |
| MC.CH.R94   | <i>A Class III Cultural Resources Survey of the Roaring Fork Railroad Authority Environmental Impact Statement, Glenwood Springs to Brush Creek Transportation Corridor, Eagle, Garfield, and Pitkin Counties, Colorado</i> (2008) | Western Cultural Resource Management, Inc.                       | Yes                |
| MC.CH.R96   | <i>A Cultural Resource Survey of Interstates 25, 70, 225, and 270, U.S. Highways 34 and 160, and State Highways 13 and 470, for the Proposed Adesta Communications Fiber Optic System, Colorado (C SW00-102)</i> (2008)            | Centennial Archaeology, Inc.                                     | No                 |
| MC.LM.R639  | <i>Class III Cultural Resource Inventory Public Service Company of Colorado, Palisade to Shoshone Transmission Line, Garfield and Mesa Counties, Colorado (BLM # CRIR 15911-04)</i> (2012)                                         | BLM Grand Junction Field Office                                  | Yes                |
| MC.PA.R78   | <i>Class III Cultural Resources Survey for the Roaring Fork Transportation Authority Bus Rapid Transit Project Along Colorado State Highway 82, Garfield, Eagle, and Pitkin Counties, Colorado</i> (2010)                          | FTA                                                              | Yes                |

The OAHF records indicate seven previously documented cultural resources are located within the 0.5-mile buffer file search area (Table 3; Figure 3, attached). None of the previously documented cultural resources intersect the project area but four previously documented cultural resources intersect the APE (5GF1661, 5GF1661.6, 5GF4554.13, and 5GF5595). All four cultural resources are linear resources including a railroad, transmission line, and road.

**Table 3. Previously documented cultural resources within the 0.5-mile buffered file search area.**

| Site Number | Name                                                | Eligibility               | Intersect the APE? |
|-------------|-----------------------------------------------------|---------------------------|--------------------|
| 5GF1661     | Denver and Rio Grande Western Railroad Aspen Branch | Officially eligible, 2020 | Yes                |

| Site Number | Name                                                           | Eligibility                                                                 | Intersect the APE? |
|-------------|----------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------|
| 5GF1661.6   | Denver and Rio Grande Western Railroad, Aspen Branch - Segment | Officially eligible, supports eligibility of entire linear resource, 2012   | Yes                |
| 5GF1662     | Atkinson Canal                                                 | Officially eligible, 1993                                                   | No                 |
| 5GF2935.5   | U.S. Highway 6 - Segment                                       | Field eligible, supports eligibility of entire linear resource, 2012        | No                 |
| 5GF4554.13  | Shoshone - Palisade Transmission Line - Segment                | Officially needs data, supports eligibility of entire linear resource, 2012 | Yes                |
| 5GF4688     | West Glenwood Springs Historical Marker                        | Unknown, 2013                                                               | No                 |
| 5GF5595     | Midland Avenue                                                 | Officially not eligible, 2019                                               | Yes                |

ERO also reviewed the CDOT Historic Sites Viewer and Historic Streetcars of Colorado databases to see if any other previously documented cultural resources are in the APE that were not included in the OAHP file search results (Colorado Department of Transportation 2024a, 2024b). Neither database identified additional previously documented cultural resources.

Lastly, ERO reviewed historical aerial imagery and the Garfield County assessor website to determine if any undocumented historical buildings or structures are in the APE (Garfield County Assessor's Office 2024; Nationwide Environmental Title Research 2024). The project area overlaps Wulfsohn Road and three parcels owned by RFTA that contain parking lots and the existing RFTA building. Wulfsohn Road and the existing RFTA building was constructed circa 2002. The parking lots were built after 2005. The APE also intersects an RFTA warehouse constructed in 2002, the Midland Center constructed circa 2005, a greenhouse at 51359 Highway 6 constructed in 2016, TRUE Automotive constructed in 1995, White Water Rafting constructed in 1995, and Water Treatment Plant Road constructed in 2009 (Garfield County Assessor's Office 2024; Nationwide Environmental Title Research 2024). None of these buildings or structures meet the age criteria to be considered cultural resources.

## Visual Effects

Four previously documented cultural resources overlap the APE (5GF1661, 5GF1661.6, 5GF4554.13, and 5GF5595). The Denver and Rio Grande Western Railroad Aspen Branch (5GF1661) is officially eligible, and segment 5GF1661.6 supports its eligibility. The Shoshone - Palisade Transmission Line – Segment officially needs data but segment 5GF4554.13 was determined supporting of its potential eligibility. Lastly, Midland Avenue (5GF5595) was determined not eligible in 2019. Because Midland Avenue is not a historic property, no further discussion of the visual effects on the resource is included in this technical memorandum.

The Denver and Rio Grande Western Railroad Aspen Branch (5GF1661) was built as a narrow-gauge railroad in November 1887 as part of competition to provide the first railroad service in the Grand Valley. It was widened to standard gauge by 1890 and experienced economic success until the Panic of 1893 (Briggs and Chance 2011). The Shoshone - Palisade Transmission Line (5GF4554) was constructed in phases from 1911 until 1941. The transmission line was upgraded to 69 kilovolt specifications by the

1960s. The section through Glenwood Canyon was rerouted in 1983 to accommodate I-70 (Engleman et al. 2011). Both locations for these linear resources were chosen for economic and geographic convenience. Neither historic property was designed with a viewshed in mind.

The proposed project includes the construction of a new single-story transit center, a three-story administration building, and a single-story storage building (see attached *Design Plans*). Viewsheds of the new construction will be limited because the two historic properties are downslope of the proposed development which is adjacent to modern buildings. The steep vegetated slope and existing development, including the current RFTA building, Midland Center, and bridges, will obscure most, if not all, of the new construction while not interrupting the prominent viewshed of the surrounding mountains (Figure 4 and Figure 5). Therefore, the integrity of setting for each historic property will not be impacted by the proposed project.



**Figure 4. View toward the proposed construction (marked with an arrow) from Midland Avenue, adjacent to segment 5GF1661.6 and segment 5GF4554.13. Photo from August 2023 courtesy of Google Street View (Google, Inc. 2024).**



**Figure 5. View toward the proposed construction (marked with an arrow) from where segment 5GF1661.6 and segment 5GF4554.13 intersect Midland Avenue. Photo from August 2023 courtesy of Google Street View (Google, Inc. 2024).**

## Summary

The file search and literature review demonstrate that there are four previously documented cultural resources overlapping the APE (5GF1661, 5GF1661.6, 5GF4554.13, and 5GF5595). The Denver and Rio Grande Western Railroad Aspen Branch (5GF1661) is officially eligible and segment 5GF1661.6 supports its eligibility. The Shoshone - Palisade Transmission Line – Segment officially needs data but segment 5GF4554.13 was determined supporting of its potential eligibility. Midland Avenue (5GF5595) was determined not eligible in 2019. The proposed development will be mostly obscured from the viewsheds of 5GF1661 and 5GF4554 by a steep vegetated slope. Therefore, ERO recommends a determination of “no adverse effect” pursuant to 36 CFR 800.5 of the NHPA.

Please feel free to contact Leslie Moore by email at [lmoore@eroresources.com](mailto:lmoore@eroresources.com) or by phone at (443) 615-0554 with any questions you may have in reference to the file and literature review results.

## Certification of Results

Leslie Moore, Senior Historian

## Attachments

Figure 1. Project Location (USGS 1:24,000 topographic quadrangle)

Figure 2. Project Location (Aerial imagery)

Figure 3. File Search Results

Design Plans

## References Cited

Briggs, Clive, and John Chance

2011 5GF1661.6 Cultural Resource Documentation Form. Prepared by ERO Resources Corporation. On file at the Office of Archaeology and Historic Preservation, Denver.

Colorado Department of Transportation

2024a CDOT Historic Sites Viewer. *CDOT Historic Sites Viewer*. Website, <https://maps.codot.gov/portal/apps/webappviewer/>.

2024b Historic Streetcars of Colorado. Online database, <https://cdot.maps.arcgis.com/apps/MapSeries/index.html?appid=3e33bb458ab54c6086556fd4a320449a>.

Engleman, Jenny, Clive Briggs, and John Chance

2011 5GF4554.13 Cultural Resource Documentation Form. Prepared by ERO Resources Corporation. On file at the Office of Archaeology and Historic Preservation, Denver.

Garfield County Assessor's Office

2024 Garfield County Assessor's Office Property Search. <https://www.garfield-county.com/assessor/residential-property/>.

Google, Inc.

2024 Google Maps Street View. *Google Maps*. Online database, [google.com/maps](https://www.google.com/maps).

Little, Barbara, Erika M. Seibert, Jan Townsend, John H. Sprinkle Jr., and John Knoerl

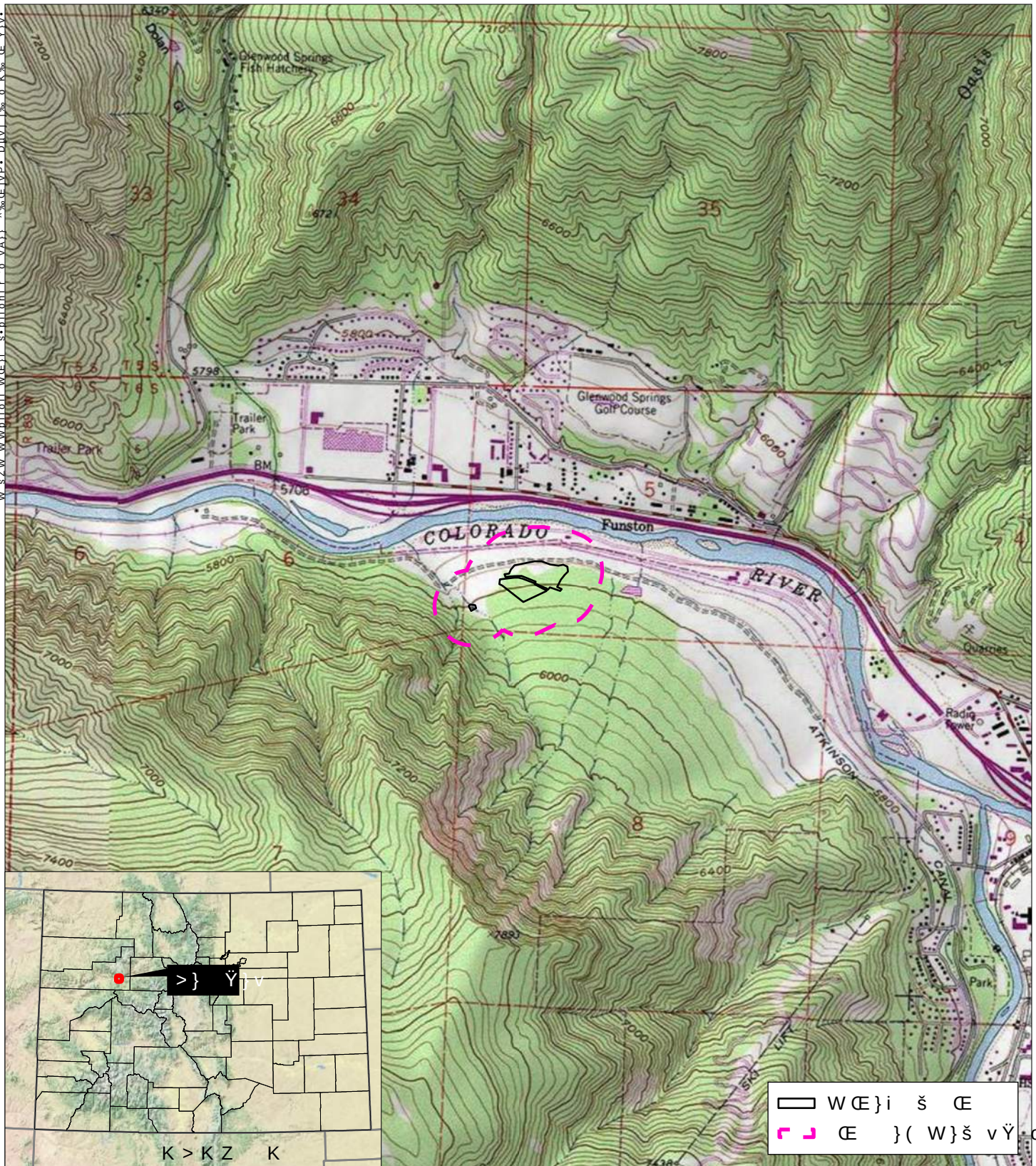
2000 *National Register Bulletin: Guidelines for Evaluating and Registering Archaeological Properties*. Prepared by the U.S. Department of the Interior.

Nationwide Environmental Title Research

2024 Historic Aerials. *National Environmental Title Research LLC*. Online database, <https://www.historicaerials.com/viewer>.



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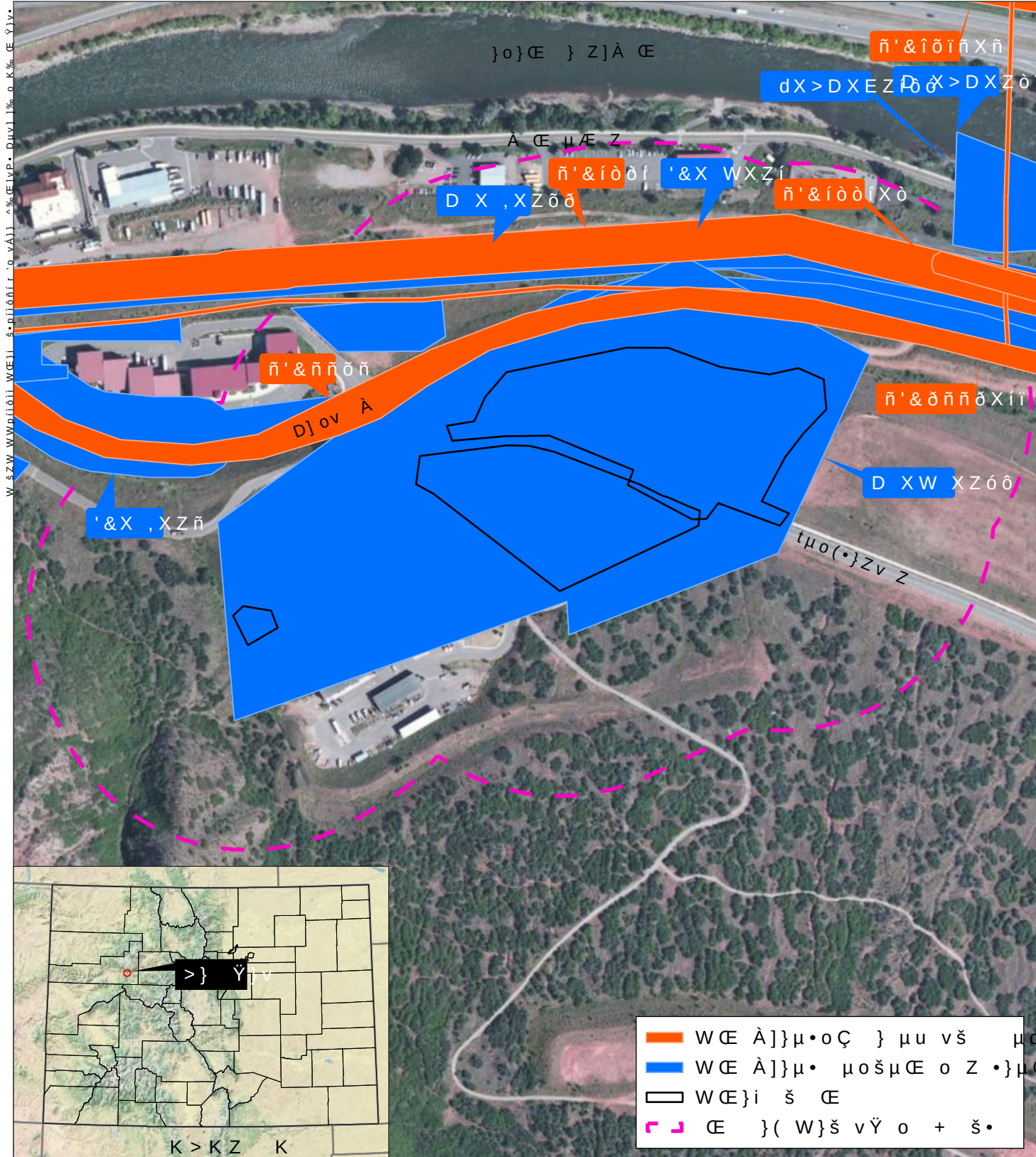
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## **Appendix I: Biological Resources**



Consultants in Natural Resources and the Environment

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## Biological Resources Report Glenwood Maintenance Facility, Phases 6A, 6B, and 8 Glenwood Springs, Colorado

Prepared for—

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ERO Project #10851

July 29, 2024

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## Summary

The Roaring Fork Transit Authority (RFTA) retained ERO Resources Corporation (ERO) to provide this Biological Resources Report (BRR) for the Glenwood Maintenance Facility, Phases 6A, 6B, and 8 project (project) in Glenwood Springs, Garfield County, Colorado (project area). The following biological resources are addressed in this BRR.

**Wetlands and Other Waters of the U.S.** – Based on a desktop assessment, an ephemeral drainage with potential wetlands may occur along the eastern boundary of Phase 6A of the project area; however, these potential aquatic resources (if present) appear to be associated with a roadside drainage swale excavated in dryland that would not carry relatively permanent flow and would be excluded by the U.S. Army Corps of Engineers from being a water of the United States. The aquatic features (if present) may be subject to the State Dredge and Fill Program (Colorado Department of Public Health and Environment (CDPHE) 2024). ***If work is planned in the drainage, ERO recommends conducting a wetland delineation to determine the presence of aquatic resources as well as the need for Clean Water Act Section 404 permitting or state permitting, as appropriate.*** Additionally, a Colorado Department of Transportation (CDOT) Wetland Finding Report would be required if permanent wetland impacts exceed 500 square feet or combined temporary and permanent wetland impacts exceed 1,000 square feet.

**Noxious Weeds** – Noxious weeds have the potential to occur in the project area. ***ERO recommends CDOT Specifications for Noxious Weed Management be incorporated into the project construction documents.***

**Federally Listed Threatened and Endangered Species** – The project area does not contain habitat for any federally listed threatened or endangered species. No further action is necessary regarding federally listed threatened and endangered species.

**State-Listed Threatened and Endangered Species and Species of Concern** – The project area is located in a Colorado Parks and Wildlife (CPW) mapped area of Bald Eagle winter range and Bald Eagle winter forage area. Because of the ambient level of human disturbance in the project area and surrounding areas, ERO biologists concluded that the project activities would not likely disturb Bald Eagles potentially using the winter range or winter forage areas. Additionally, wetlands (if present) in the project area provide potential habitat for northern leopard frog; however, the northern leopard frog is unlikely to occur in the project area since it lacks permanent waterbodies.

**Other Wildlife** – The project area is located in High Priority Habitat for Elk Severe Winter Range mapped by CPW. The project area is predominantly impervious surfaces and existing disturbed areas adjacent to the existing facilities; however, surrounding the project area, suitable foraging habitat occurs for a variety of wildlife including black bear, elk, mountain lion, and mule deer. The project area is shown as occurring in black bear overall range, black bear fall concentration area, elk overall range, elk winter range, elk severe winter range, moose overall range, moose summer range, moose winter range, mountain lion overall range, mule deer overall range, mule deer winter range, and mule deer summer range. Due to the existing activities in the vicinity, the proposed project is unlikely to impede wildlife movement in the project area; however, during construction, wildlife could be temporarily disturbed by construction activities. ***ERO recommends contacting the local CPW district manager and requesting concurrence that the proposed project would not likely affect wintering ungulates.***

**Migratory Birds and Raptors** – Vegetation in and adjacent to the project area provides habitat for a variety of migratory birds including Bald Eagle. The Denver Field Office of the U.S. Fish and Wildlife Service (2009) and CDOT (2011) have identified the primary nesting season for migratory birds in eastern Colorado as occurring from April 1 through August 31. However, some birds, such as the Red-Tailed Hawk and Great Horned Owl, can nest as early as February or March. Because of variability in the breeding seasons of various bird species, ***ERO recommends a nest survey be conducted within one week prior to construction*** to determine if any active nests are present in the project area so they can be avoided. If active nests are found, any work that would destroy the nests could not be conducted until the birds have vacated the nests. If possible, ground-clearing activities should occur outside of the April 1 through August 31 migratory bird breeding season. If construction activities would occur during the migratory bird breeding season, a nest survey should be conducted immediately prior to construction.

**Colorado Shortgrass Prairie Initiative (SGPI)** – The project area is located outside of CDOT’s mapped area for SGPI consultation. As such, no further action under SGPI is necessary.

**Senate Bill 40 (SB40) Regulated Areas** – No streams that fall under SB40 regulation occur in the project area; therefore, the project does not require SB40 Wildlife Certification.

# **Biological Resources Report Glenwood Maintenance Facility, Phases 6A, 6B, and 8 Glenwood Springs, Colorado**

**July 29, 2024**

## **Introduction**

The Roaring Fork Transit Authority (RFTA) retained ERO Resources Corporation (ERO) to provide this Biological Resources Report (BRR) for the Glenwood Maintenance Facility, Phases 6A, 6B, and 8 project (project) in Glenwood Springs, Garfield County, Colorado (project area; Figure 1 and Figure 2).

This BRR presents the findings of a desktop review, and no 2024 site visit was performed as part of this assessment (2024 desktop review). The 2024 desktop review was informed by field studies previously conducted in 2020 for earlier phases of the overall project. During the 2024 desktop review, activities included analyzing potential wetlands; identifying federal- and state-listed threatened, endangered, candidate, and proposed (T&E) species habitat; and identifying other natural resources that might affect the proposed project. This BRR provides information on site conditions and resources as well as current regulatory requirements related to those resources.

## **Project Description**

RFTA proposes to renovate and expand its current maintenance facility into a new centrally located operations, maintenance, and administrative center called the Regional Transit Center (RTC). The RTC will function as the main regional transit center for RFTA. The RTC will address RFTA's current operational deficiencies and accommodate forecasted growth in population, employment, and ridership demand in RFTA's three-county service area. The RTC will provide sufficient bus storage, operations, maintenance, and administrative capacity and capability to support RFTA's long-term vision of creating greater connectivity between local, regional, and statewide transit systems as shown in the project phases in Table 1.

**Table 1. Project phases.**

| Phase | Scope                                                                                                                                                                                                                                                                             |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Lowering and grading the existing grade and construction of a temporary bus parking lot (for maintaining operations during future phases).                                                                                                                                        |
| 2     | Additional grading and excavation, and renovation and expansion of a fleet maintenance building.                                                                                                                                                                                  |
| 3     | <b>Demolition, grading, excavation, and site preparation of the area shown on Figure 2. Construction of a new Operations Center, Bus Storage Building A (with 30 indoor bus storage spaces), pre-trip bus inspection zones, bus backlog parking, and Maintenance Warehouse A.</b> |
| 4     | <b>Glenwood Maintenance Facility Administration building renovation. Relocate access road.</b>                                                                                                                                                                                    |
| 5     | <b>Construction of Bus Building 30B, associated drives, and pre-trip bus inspection zones.</b>                                                                                                                                                                                    |
| 6     | Construction of RFTA Administration Building with associated drives and parking area.                                                                                                                                                                                             |
| 7     | <b>Construction of bus fueling drive lanes and a bus wash area.</b>                                                                                                                                                                                                               |
| 8     | <b>Construction of Warehouse B, associated drives, and parking area.</b>                                                                                                                                                                                                          |
| 9     | Construction of RFTA Housing Phase 1 with associated drives and parking.                                                                                                                                                                                                          |
| 10    | Construction of RFTA Housing Phase 2 with associated drives and parking.                                                                                                                                                                                                          |

## Methods

During the 2024 desktop review, ERO analyzed available data to review and document biological resources in the project area. Any notable biological resources identified were recorded using aerial photographs. Specific methods for assessing biological resources included the following:

- **Waters of the U.S. (WOTUS), including wetlands:** ERO reviewed the U.S. Geological Survey (USGS) Glenwood Springs, CO topographic quadrangle map, National Wetland Inventory (NWI), National Hydrography Dataset (NHD), and aerial photography to identify mapped streams, areas of open water, and potential areas that could indicate wetlands or WOTUS.
- **Noxious weeds:** The potential for noxious weeds to occur in the project area was assessed using data gathered from the 2020 site visit.
- **Federally listed T&E species:** ERO reviewed the U.S. Fish and Wildlife Service (Service) list of federally listed species to identify T&E species having potential habitat in the project area and evaluated project conditions for suitable habitat for these species.
- **State-listed T&E species:** ERO reviewed the Colorado Parks and Wildlife (CPW) list of state-listed species to identify T&E species and species of concern having potential habitat in the project area and evaluated project conditions for suitable habitat for these species.
- **Wildlife:** ERO conducted a literature and database review of the Colorado T&E species list (CPW 2023a), CPW high-priority habitat (CPW 2021b), and other species wildlife data (CPW 2023b; CNHP 2024).
- **Migratory birds and raptors:** ERO reviewed the CPW nest database for any known nests within 0.5 mile of the project area (CPW 2023d).
- **Colorado Shortgrass Prairie Initiative (SGPI):** ERO conducted a site evaluation of the project area per the SGPI (Granau, Lee et al. 2003). The SGPI generally covers areas in Colorado east of Interstate 25 (I-25), with some smaller areas west of I-25.
- **Senate Bill 40 (SB40) regulated areas:** ERO assessed the project area for areas regulated under SB40 Wildlife Certification by reviewing USGS topographic maps (Figure 1) and the SB40 Wildlife Certification Guidelines (CPW and CDOT 2022).



Glenwood Maintenance Facility, Phase 6A, 6B, and 8

Section 5, T6S, R89W; 6th PM  
UTM NAD 83: Zone 13N; 297716mE, 4381291mN  
Longitude 107.354523°W, Latitude 39.557471°N  
USGS Glenwood Springs, CO Quadrangle  
Garfield County, Colorado

 Project Area



Figure 1  
Vicinity Map

Prepared for: Shrewsberry &  
Associates, LLC  
File: 10851 BRR Figure 1.mxd (GS)  
July 29, 2024







### Glenwood Maintenance Facility, Phase 6A, 6B, and 8

-  Inlet or Outfall
-  Ordinary High Water Mark
-  Limit of Delineation
-  Project Area Boundary
-  Flow Path

Image Source: Maxar Technologies©, September 27, 2023

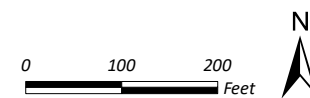


Figure 2  
Existing Conditions

Prepared for: Shrewsberry &  
Associates, LLC  
File: 10851 BRR Figure 2.mxd (GS)  
July 29, 2024

**ERO**  
ERO Resources Corp.



## Observations and Results

### General Site Conditions, Vegetation Communities, and Wildlife Habitat

The project area is located south of the intersection of Wolfsohn Road and Midland Avenue, just south of the Colorado River and I-70 in Glenwood Springs, Colorado (Figure 1). The project area is in Section 5, Township 6 South, Range 89 West of the 6th Principal Meridian in Garfield County, Colorado (Figure 1). The UTM coordinates for the approximate center of the project area are 297716mE, 4381291mN, Zone 13 North. The longitude/latitude of the project area is 107.354523°W/39.557471°N. The elevation of the project area is approximately 5,800 feet above sea level.

The project area consists primarily of previously developed and disturbed land with existing paved lots, landscaping, temporary parking areas, equipment storage, and previously disturbed uplands (Figure 2). Wulfsohn Mountain Park trails and open space occurs to the east, south, and west; and an unnamed ephemeral drainage mapped in 2020 occurs south of Phase 8 of the project area (Figure 2).

Based on the 2024 desktop review, a minimal amount of vegetation occurs in the project area. This vegetation is likely dominated by a mix of native and nonnative upland species including cheatgrass (*Bromus tectorum*) and smooth brome (*Bromus inermis*). Ornamental tree and shrub landscaping may also occur in the project area and include plains cottonwood (*Populus deltoides*), Colorado blue spruce (*Picea pungens*), ponderosa pine (*Pinus ponderosa*), and common juniper (*Juniperus communis*) trees. The open space surrounding the project area is a Gambel oak (*Quercus gambelii*)-dominated ecosystem extending around the base of Wulfsohn Mountain.

### Waters of the U.S., Including Wetlands

During the 2024 desktop review, assessed the project area for potential WOTUS, including abutting and adjacent wetlands. ERO reviewed USGS quadrangle topographic maps, the NHD, the NWI, and aerial photography to identify mapped streams, areas of open water, and potential areas that could indicate wetlands or WOTUS.

The project area is within Hydrologic Unit 12-140100050102 (South Canyon Creek-Colorado River subwatershed). The USGS Glenwood Springs, CO topographic quadrangle map, along with the NHD and NWI, indicate unnamed intermittent streams flow just west of Phase 8 of the project area and approximately 0.2 mile east of Phase 6A. During the 2020 site visit, one ephemeral drainage was mapped just west of Phase 8 (Figure 2). Based on aerial imagery, a potential drainage area may contain water and associated wetlands along the eastern boundary of Phase 6A. If present, these features appear to be associated with a roadside drainage swale excavated in dryland that would not carry a relatively permanent flow and would be excluded by the U.S. Army Corps of Engineers (Corps) from being a WOTUS. However, the aquatic features (if present) may be subject to State Dredge and Fill Policies (CDPHE 2024).

## Recommendations

Based on the 2020 site visit and 2024 desktop review, no wetlands or WOTUS occur in Phase 6B or Phase 8 of the project area, and no further actions are required for those phases.

The eastern boundary of Phase 6A has the potential to support aquatic resources. If work is planned in this portion of Phase 6A, ERO recommends conducting a wetland delineation to confirm the presence/absence of aquatic resources, as well as the need for Clean Water Act (CWA) Section 404 permitting or compliance with State Dredge and Fill Policies (CDPHE 2024), as appropriate. Additionally, a CDOT Wetland Finding Report would be required if permanent wetland impacts exceed 500 square feet or combined temporary and permanent wetland impacts exceed 1,000 square feet.

## Noxious Weeds

Although a noxious weed survey was not conducted in 2024, the 2020 findings indicate that noxious weeds have the potential to occur in the project area. ERO recommend adding CDOT Specifications for Noxious Weed Management to the project construction documents.

## Federally Listed Threatened and Endangered Species

ERO assessed the project area for potential habitat for T&E species under the Endangered Species Act (ESA) of 1973, as amended (16 United States Code 1531 et seq.). Federal T&E species are protected under the ESA. Significant adverse effects on a federally listed species or its habitat require consultation with the Service under Section 7 or 10 of the ESA. Federally listed T&E species with habitat in the project area or with potential to be affected by projects in the project area are listed in Table 2.

**Table 2. Federally listed T&E species potentially found in the project area or potentially affected by projects in the project area.**

| Common Name          | Scientific Name                  | Status* | Habitat                                                                | Habitat Present or Potential to Be Affected by the Project? |
|----------------------|----------------------------------|---------|------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Mammals</b>       |                                  |         |                                                                        |                                                             |
| Canada lynx          | <i>Lynx canadensis</i>           | T       | Climax boreal forest with a dense understory of thickets and windfalls | No suitable habitat                                         |
| Gray wolf            | <i>Canis lupus</i>               | E       | Temperate forests, mountains, tundra, taiga, grasslands, and deserts   | No suitable habitat                                         |
| <b>Birds</b>         |                                  |         |                                                                        |                                                             |
| Mexican Spotted Owl  | <i>Strix occidentalis lucida</i> | T       | Closed canopy forests in steep canyons                                 | No suitable habitat                                         |
| Yellow-billed Cuckoo | <i>Coccyzus americanus</i>       | T       | Wooded habitat with dense cover and nearby water                       | No suitable habitat and outside of known breeding areas     |

| Common Name                | Scientific Name                 | Status* | Habitat                                                                                                                     | Habitat Present or Potential to Be Affected by the Project? |
|----------------------------|---------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Fish</b>                |                                 |         |                                                                                                                             |                                                             |
| Bonytail chub              | <i>Gila elegans</i>             | E       | Backwaters with rocky or muddy bottoms and flowing pools                                                                    | No suitable habitat                                         |
| Colorado pikeminnow        | <i>Tychocheilus lucius</i>      | E       | Warm rivers that have large snowmelt runoff and lower, relatively stable base flows                                         | No suitable habitat                                         |
| Humpback chub              | <i>Gila cypha</i>               | T       | Pools with substrates of silt, sand, boulder, or bedrock                                                                    | No suitable habitat                                         |
| Razorback sucker           | <i>Xyrauchen texanus</i>        | E       | Large river species in areas with strong current and backwaters                                                             | No suitable habitat                                         |
| <b>Insects</b>             |                                 |         |                                                                                                                             |                                                             |
| Monarch butterfly          | <i>Danaus plexippus</i>         | C       | Open fields and meadows with milkweed                                                                                       | No suitable habitat                                         |
| Silverspot butterfly       | <i>Speyeria nokomis nokomis</i> | T       | Streamside meadows and open seepage areas in generally desert landscapes                                                    | No suitable habitat                                         |
| <b>Plants</b>              |                                 |         |                                                                                                                             |                                                             |
| Ute ladies'-tresses orchid | <i>Spiranthes diluvialis</i>    | T       | Moist to wet alluvial meadows, floodplains of perennial streams, and around springs and lakes below 7,800 feet in elevation | No suitable habitat                                         |

\*T = Federally Threatened Species; E = Federally Endangered Species; C = Federal Candidate Species.  
Source: Service 2024.

There is no likelihood for the proposed project to affect the Canada lynx, gray wolf, Mexican Spotted Owl, Yellow-Billed Cuckoo, bonytail chub, Colorado pikeminnow, humpback chub, razorback sucker, monarch butterfly, silverspot butterfly, or Ute-ladies' tresses orchid because of the lack of habitat in the project area. Because no suitable habitat for these species occurs in the project area, no additional action is necessary regarding these species.

## State-Listed Threatened and Endangered Species and Species of Concern

Numerous species that potentially occur in the project area in Garfield County are considered T&E or species of concern by the State of Colorado (Table 3). According to Colorado law (Colo. Rev. Stat. Ann. §§ 33-2-102-106), the state must maintain a list of species determined T&E in the state. State-listed wildlife species that are not already protected under the ESA are protected under State Statute 33, which is regulated by CPW. No regulations currently exist for state species of concern. However, if any species were to be listed during construction, state regulations could be enforced.

The habitat affinities, presence of habitat in the project area, and impacts on these species or habitats are provided in the following discussion.

**Table 3. CPW T&E species and species of concern potentially occurring in the project area in Garfield County.**

| Common Name                    | Scientific Name (Status*)                        | General Colorado Range                                                 | Habitat Present                                                                                                                                                    |
|--------------------------------|--------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mammals</b>                 |                                                  |                                                                        |                                                                                                                                                                    |
| Canada lynx                    | <i>Lynx canadensis</i> (SE)                      | Climax boreal forest with a dense understory of thickets and windfalls | No suitable habitat                                                                                                                                                |
| Kit fox                        | <i>Vulpes macrotis</i> (SE)                      | Desert scrub, chaparral, and grasslands                                | No suitable habitat                                                                                                                                                |
| North American wolverine       | <i>Gulo gulo luscus</i> (SE)                     | Subalpine forests above 8,000 feet in elevation                        | No suitable habitat                                                                                                                                                |
| Townsend's big eared bat       | <i>Corynorhinus townsendii</i> (SC)              | Woodlands with rocky outcrops                                          | Located in overall range, but no suitable roost sites are located in the project area                                                                              |
| <b>Birds</b>                   |                                                  |                                                                        |                                                                                                                                                                    |
| American Peregrine Falcon      | <i>Falco peregrinus anatum</i> (SC)              | Cliffs/canyons                                                         | No suitable habitat located within 0.5 mile of project area; nearest known nesting area is approximately 1.75 miles east of the project area                       |
| Bald Eagle                     | <i>Haliaeetus leucocephalus</i> (ST)             | Near reservoirs and perennial rivers                                   | Project area is located in CPW-mapped Bald Eagle winter range and winter forage areas; however, no Bald Eagle nests are mapped within 0.5 mile of the project area |
| Columbia Sharp-Tailed Grouse   | <i>Tympanuchus phasianellus columbianus</i> (SC) | Native bunchgrass and shrub-steppe communities                         | No suitable habitat                                                                                                                                                |
| Ferruginous Hawk               | <i>Buteo regalis</i> (SC)                        | Open prairie and desert habitats                                       | No suitable habitat                                                                                                                                                |
| Greater Sandhill Crane         | <i>Grus canadensis tabida</i> (SC)               | Mudflats around reservoirs, moist meadows, agricultural areas          | No suitable habitat                                                                                                                                                |
| Sage Grouse                    | <i>Centrocercus urophasianus</i> (SC)            | Shrub-steppe habitats between 4,000 and 9,000 feet in elevation        | No suitable habitat                                                                                                                                                |
| Western Yellow-Billed Cuckoo   | <i>Coccyzus americanus occidentalis</i> (SC)     | Wooded habitat with dense cover and nearby water                       | No suitable habitat and outside of known breeding areas                                                                                                            |
| <b>Fish</b>                    |                                                  |                                                                        |                                                                                                                                                                    |
| Colorado River cutthroat trout | <i>Salmo clarki pleuriticus</i> (SC)             | Cold mountain streams and rivers above 7,000 feet in elevation         | No suitable habitat                                                                                                                                                |
| Razorback sucker               | <i>Xyrauchen texanus</i>                         | Large river species in areas with strong current and backwaters        | No suitable habitat                                                                                                                                                |
| Roundtail chub                 | <i>Gila latipinnis</i> (SC)                      | Slow-moving portions of the Colorado River and tributaries             | No suitable habitat                                                                                                                                                |
| <b>Reptiles</b>                |                                                  |                                                                        |                                                                                                                                                                    |
| Longnose leopard lizard        | <i>Gambelia wislizenii</i> (SC)                  | Arid and semiarid plains                                               | No suitable habitat                                                                                                                                                |
| Midget faded rattlesnake       | <i>Crotalus oreganus concolor</i> (SC)           | Only found in the Green River in Colorado                              | No suitable habitat                                                                                                                                                |

| Common Name           | Scientific Name (Status*)      | General Colorado Range                   | Habitat Present                              |
|-----------------------|--------------------------------|------------------------------------------|----------------------------------------------|
| <b>Amphibians</b>     |                                |                                          |                                              |
| Boreal toad           | <i>Anaxyrus boreas</i> (SE)    | High-altitude wetlands                   | No suitable habitat                          |
| Northern leopard frog | <i>Lithobates pipiens</i> (SC) | Wetlands, slow-moving streams, and ponds | No known suitable habitat; unlikely to occur |

\*SE = Colorado Endangered Species; ST = Colorado Threatened Species; SC = Colorado Species of Special Concern.

Sources: CPW 2023b; Colorado Natural Heritage Program 2024.

Of the species listed in Table 3, only the Bald Eagle (*Haliaeetus leucocephalus*) and northern leopard frog (*Lithobates pipiens*) have the potential to occur in the project area and are discussed in more detail below.

The Canada lynx, kit fox, North American wolverine, Townsend's big-eared bat, American Peregrine Falcon, Columbia Sharp-Tailed Grouse, Ferruginous Hawk, Greater Sandhill Crane, Sage Grouse, Western Yellow-Billed Cuckoo, Colorado River cutthroat trout, razorback sucker, roundtail chub, longnose leopard lizard, midget faded rattlesnake, and boreal toad would not be affected by the proposed project because the project area is outside of the known range, suitable habitat is not present, or potential habitat would not be impacted by project activities and, therefore, these species are not discussed in the following sections.

### Bald Eagle

The Bald Eagle is a large North American bird with a historical distribution throughout most of the U.S. Most Bald Eagle nesting in Colorado occurs near lakes or reservoirs or along rivers. Typical Bald Eagle nesting habitat consists of forests or wooded areas that contain tall, aged, dying, and dead trees (Martell 1992). Bald Eagles seek aquatic habitat for foraging and typically prefer fish, although they also feed on birds, mammals, and carrion, particularly in winter (Buehler 2000; Sharps and Uresk 1990). Prairie dogs provide a major food resource for Bald Eagles wintering along the Colorado Front Range (Environmental Science and Engineering 1988).

No known Bald Eagle nests occur in the project area or within a 0.5-mile radius of the project area (the CPW-recommended buffer) and no Bald Eagles were observed during the 2020 site visit; however, the project area occurs in an area mapped as Bald Eagle winter range and Bald Eagle winter forage area (CPW 2023b). Winter range typically refers to those areas where Bald Eagles have been observed between November 15 and April 1 (CPW 2023b).

The project area consists primarily of existing disturbed areas. Other infrastructure and buildings within 0.5 mile of the project area include I-70, local roads, a railroad corridor, and various other commercial buildings and parking structures. Additional sources of anthropogenic (human-caused) disturbance in proximity of the project area include pedestrians, mountain bike cyclists, and other users of the open space area trails surrounding the project area. Because of the ambient level of human disturbance in the project area and surrounding area, ERO biologists concluded that the project activities would not likely disturb Bald Eagles potentially using the winter range or winter forage areas.

### **Northern Leopard Frog**

The northern leopard frog (*Lithobates pipiens*) is a species of special concern in Colorado (CPW 2023a). Worldwide and locally in Colorado, amphibian populations have declined for reasons not well known. In Colorado, this frog can be found nearly statewide in mountains and lowlands but is scarce or absent in most of southeastern Colorado and the Republican River drainage in northeastern Colorado (CPW 2016). It is considered locally common but now rare or extirpated in many areas, particularly in the mountains.

The northern leopard frog prefers the banks and shallow portions of marshes, wet meadows, ponds, lakes, and streams, particularly where rooted aquatic vegetation is present (Hammerson 1999). The frogs prefer permanent water bodies and are a wide-ranging species known to elevations of 11,000 feet. In summer, they commonly inhabit wet meadows and fields. They take cover underwater, in damp niches, or in caves when inactive. Wintering sites are usually underwater, though some frogs possibly overwinter underground (Karns 1992).

If present, wetlands in or adjacent to the project area are potentially suitable habitat for northern leopard frogs. No northern leopard frogs were observed during the 2020 site visit; however, it is possible that the species occupies habitat in or adjacent to the project area. If the northern leopard frog is present in the project area, the project may adversely impact individuals. However, the project area is not likely to support habitat for this species nor are project activities likely to cause a trend toward federal listing or a loss of species viability throughout its range because the project area does not fit the description of preferred habitat because of a lack of permanent water bodies preferred by this frog.

### **Other Wildlife**

The project area is shown as occurring in the CPW-mapped High Priority Habitat for Elk Severe Winter Range (CPW 2021). For any work conducted in areas mapped in the Elk Severe Winter Range, ERO recommends contacting the local CPW district manager requesting concurrence that the proposed project would not likely affect elk. However, because the project would primarily occur in previously disturbed areas and because of the ambient level of human disturbance in the project area and surrounding area, ERO biologists concluded that the project activities would likely only temporarily disturb elk potentially using the severe winter range.

A variety of other wildlife may occur in or adjacent to the project area, and the project area is shown as occurring in black bear (*Ursa americanus*) overall range, black bear fall concentration area, elk (*Cervus canadensis*) overall range, elk winter range, elk severe winter range, moose (*Alces alces*) overall range, moose summer range, moose winter range, mountain lion (*Puma concolor*) overall range, mule deer (*Odocoileus hemionus*) overall range, mule deer winter range, and mule deer summer range (Natural Diversity Information Source 2021). The project area abuts open space to the south, west, and east; however, the surrounding areas to the north have been significantly disturbed by human development, including construction of commercial and residential properties and roads. Additionally, the project area provides little suitable habitat for wildlife as it consists predominantly of paved and disturbed areas.



During the 2020 site visit, mule deer scat was observed south of the project area. It is likely that mountain lion, black bear, elk, and mule deer may forage or migrate adjacent to the project area; however, no designated wildlife corridors are mapped in the vicinity of the project area (CPW and CDOT 2024).

## **Migratory Birds and Raptors**

Migratory birds, as well as their eggs and nests, are protected under the Migratory Bird Treaty Act (MBTA). In Colorado, all birds except for the European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and rock dove (pigeon; *Columba livia*) are protected under the MBTA. The MBTA does not contain any prohibition that applies to the destruction of a bird nest alone (without birds or eggs), provided that no possession occurs during the destruction. While destruction of a nest by itself is not prohibited under the MBTA, nest destruction that results in the unpermitted take of migratory birds or their eggs is illegal and fully prosecutable under the MBTA (Service 2003b). The regulatory definition of a take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect (50 Code of Federal Regulations 10.12).

Under the MBTA, the Service may issue nest depredation permits, which allow a permittee to remove an active nest. The Service, however, issues few permits and only under specific circumstances, usually related to human health and safety. Obtaining a nest depredation permit is unlikely and involves a process that takes, at a minimum, 8 to 12 weeks. The best way to avoid a violation of the MBTA is to remove vegetation outside of the active breeding season, which typically falls between March and August, depending on the species. MBTA enforcement actions are typically the result of a concerned member of the community reporting a violation.

## **Potential Habitat and Effects**

ERO reviewed the CPW nest database for any known nests in the project area (CPW 2023c). No known raptor nests occur in the project area or within a 0.5-mile radius of the project area. During the 2020 site visit, ERO observed one potentially active rock dove (pigeon) nest inside an outbuilding near the southeastern portion of the project area; however, this species is not protected under the MBTA. During the 2020 site visit, ERO also observed an American crow (*Corvus brachyrhynchos*) foraging south of the project area. The breeding season for most birds in Colorado is March through August, with the exception of a few species that begin breeding in February, such as great-horned owls. CPW recommends a 0.33- or 0.25-mile buffer from active raptor nests, depending on the species (CPW 2020).

## **Recommendations**

To avoid destruction of potential migratory bird nests, vegetation removal should be conducted outside of the breeding season. CDOT has identified the primary nesting season for migratory birds in Colorado as occurring from April 1 through August 31 (CDOT 2011). Because of variability in the breeding seasons, ERO recommends that a nest survey be conducted within one week prior to construction to determine if any active nests are present in the project area so that they can be avoided. Additional nest surveys during the nesting season may also be warranted to identify active nesting species that may present

additional development timing restrictions (e.g., Bald Eagles or Red-Tailed Hawks). If active nests are identified in or near the project area, activities that would directly affect the nests should be restricted. Habitat-disturbing activities (e.g., tree removal, grading, scraping, and grubbing) should be conducted during the nonbreeding season to avoid disturbing active nests, or to avoid a “take” of the migratory bird nests in the project area. Nests can be removed during the September 1 through March 31 nonbreeding season to preclude future nesting and avoid violations of the MBTA. There is no process for removing nests during the nonbreeding season; however, nests may not be collected under MBTA regulations. If the construction schedule does not allow vegetation removal outside of the breeding season, a nest survey should be conducted immediately prior to vegetation removal to determine if the nests are active and by which species. If active nests are found, any work that would destroy the nests or cause the birds to abandon young in the nest could not be conducted until the birds have vacated the nests.

The CPW has recommended buffer zones of 0.33 mile for active Red-Tailed Hawk nests and 0.25 mile for active Swainson’s Hawk nests (CPW 2020). Activities that would directly impact an active nest, or that would encroach close enough to cause adult birds to abandon the nest during the breeding season, should be restricted. Construction activities that could potentially be within a Red-Tailed Hawk or other raptor buffer zone should commence outside of the February 15 through August 31 breeding season. Consultation with CPW or the Service may be required if construction is proposed within the CPW-recommended buffer zone of an active raptor nest.

## **Colorado SGPI**

CDOT developed a programmatic agreement with the Service, the Federal Highway Administration, CPW, The Nature Conservancy, and the Colorado Natural Heritage Program to address potential effects of CDOT routine maintenance and upgrade activities on a number of T&E, proposed, candidate, and sensitive species found in the shortgrass prairie ecoregion of eastern Colorado (Service 2003a). The SGPI agreement generally covers areas in Colorado east of I-25, with some smaller areas west of I-25 (covered area).

ERO reviewed the covered area under the agreement, and the project area does not occur in the covered area. As such, no further action under the SGPI is necessary.

## **SB40 Regulated Areas**

ERO assessed the project area for areas regulated under SB40 Wildlife Certification. SB40 requires state agencies to evaluate their actions for potential effects on streams important for fish and wildlife resources. CDOT and CPW have developed a consultation process for CDOT projects that includes criteria for which streams fall under SB40 jurisdiction and mitigation required for impacts on jurisdictional streams and associated riparian vegetation. SB40 jurisdictional streams are generally perennial, ephemeral, or intermittent streams that provide flowing water beneficial to fish and wildlife. Drainage ditches do not fall under SB40 jurisdiction.

ERO assessed the project area for areas regulated under SB40 Wildlife Certification. SB40 requires state agencies to evaluate their actions for potential effects on streams important for fish and wildlife resources. No streams falling under SB40 regulation occur in the project area; therefore, the project does not require SB40 Wildlife Certification.

## Conclusions

The project area contains a limited number of regulated or sensitive biological resources that would need to be addressed during project design and construction. The impacts for each biological resource and recommended actions, including any mitigation commitments, are described in Table 4.

**Table 4. Impacts, recommended actions, and mitigation commitments for each biological resource in the project area.**

| Biological Resource                                   | Impact                                                                                                                                                                                                                                                                                                                                                        | Recommended Actions/<br>Mitigation Commitments                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waters of the U.S., including wetlands                | Phase 6B and Phase 8 would not result in any impacts on wetlands or other WOTUS.<br><br>The eastern boundary of Phase 6A has the potential to support wetlands or other WOTUS; however, these aquatic resources (if present) are unlikely to be found jurisdictional by the Corps.                                                                            | If work is planned along the eastern boundary of Phase 6A, ERO recommends conducting a wetland delineation and determining the need for CWA Section 404 permitting or compliance with State Dredge and Fill Policies (CDPHE 2024). Additionally, a CDOT Wetland Finding Report will be required if permanent wetland impacts exceed 500 square feet or combined temporary and permanent wetland impacts exceed 1,000 square feet. If no work is planned to occur in these areas, no further action is necessary. |
| Noxious weeds                                         | Noxious weed species could potentially be present in the project area.                                                                                                                                                                                                                                                                                        | CDOT specifications for Noxious Weed Management outlining best management practices to reduce the introduction and spread of noxious weeds should be added to the project construction documents.                                                                                                                                                                                                                                                                                                                |
| Federally listed T&E species                          | No habitat for federally listed T&E species occurs in the project area.                                                                                                                                                                                                                                                                                       | No further action regarding federally listed T&E species is required due to the lack of suitable habitat in the project area. .                                                                                                                                                                                                                                                                                                                                                                                  |
| State-listed T&E species and state species of concern | The project area contains potential habitat for Bald Eagles.                                                                                                                                                                                                                                                                                                  | No known Bald Eagle nests are within the CPW-recommended buffer of 0.5 mile; therefore, no further action is necessary regarding state-listed T&E species.                                                                                                                                                                                                                                                                                                                                                       |
| Wildlife                                              | The project area is located in CPW-mapped High Priority Habitat for Elk Severe Winter Range. Due to the ambient level of human disturbance in the project area, it is unlikely the proposed project would permanently impede wildlife movement in the project area. However, it is likely wildlife would be temporarily disturbed by construction activities. | ERO recommends contacting the local CPW district manager requesting concurrence that the proposed project would not likely affect wintering elk.                                                                                                                                                                                                                                                                                                                                                                 |
| Migratory birds and raptors                           | No known raptor migratory bird nests occur in the project area or within a 0.5-mile radius of the project area.                                                                                                                                                                                                                                               | Vegetation should be removed outside of the breeding season and, minimally, a nest survey should be conducted within one week prior to construction activities. Section 240 Specification should be added to the project construction documents.                                                                                                                                                                                                                                                                 |
| Colorado SGPI                                         | The project area does not occur in the SGPI covered area.                                                                                                                                                                                                                                                                                                     | No further action is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Biological Resource  | Impact                                                 | Recommended Actions/<br>Mitigation Commitments |
|----------------------|--------------------------------------------------------|------------------------------------------------|
| SB40 regulated areas | No SB40 regulated resources occur in the project area. | SB40 Wildlife Certification is not required.   |

## References

- Buehler, D. A. 2000. "Bald Eagle (*Haliaeetus Leucocephalus*), Version 2.0." In *The Birds of North America*. Cornell Lab of Ornithology, Ithaca, New York, USA. <https://doi.org/10.2173/bna.506>.
- Colorado Department of Public Health and Environment. 2024. "Discharges of Dredged and Fill Material into State Waters." 2024. <https://cdphe.colorado.gov/dredge-and-fill>.
- Colorado Department of Transportation. 2011. "Section 240, Protection of Migratory Birds." <https://www.codot.gov/programs/environmental/wildlife/guidelines/BirdspecCDOTbio.pdf/view>.
- Colorado Natural Heritage Program. 2024. "Colorado's Conservation Data Explorer (CODEX)." <https://codex.cnhp.colostate.edu/>.
- Colorado Parks and Wildlife. 2016. "Leopard Frogs: Assessing Habitat Quality for Priority Wildlife Species in Colorado Wetlands."
- . 2020. "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors." <https://cpw.state.co.us/Documents/WildlifeSpecies/LivingWithWildlife/Raptor-Buffer-Guidelines.pdf>.
- . 2021a. "CPW Recommendations to Avoid and Minimize Impacts to Wildlife from Land Use Development in Colorado."
- . 2021b. "Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls." Colorado Parks and Wildlife. <https://cpw.state.co.us/Documents/WildlifeSpecies/LivingWithWildlife/Recommended-Survey-Protocol-Burrowing-Owls.pdf>.
- . 2023a. "Colorado Listing of Endangered, Threatened and Wildlife Species of Special Concern." 2023. <https://cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx>.
- . 2023b. "Colorado Parks and Wildlife - Species Activity Data." 2023. <https://www.arcgis.com/home/group.html?id=0e6f9051b06146018038e9a929ab4910#overview>.
- . 2023c. "Colorado Parks and Wildlife Threatened and Endangered List." 2023. <https://cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx>.
- . 2023d. "Raptor Database." Raptor Nest Database provided to ERO Resources Corporation under Non-disclosure Agreement to keep nest location information confidential and sensitive.
- Colorado Parks and Wildlife and Colorado Department of Transportation. 2022. "Guidelines for Senate Bill 40 Wildlife Certification Developed and Agreed Upon by Colorado Parks and Wildlife and the Colorado Department of Transportation." CPW and CDOT. <https://www.codot.gov/programs/environmental/wildlife/guidelines/sb-40-wildlife-certification-guidelines-2018>.
- . 2024. "Wildlife Crossings in Colorado." 2024. <https://experience.arcgis.com/experience/309a78b1c4ce4c93bcd20400682f363b>.
- Environmental Science and Engineering. 1988. "Bald Eagle Study Winters 1986-1987, 1987-1988 Final Report." Prepared for the Office of the Program Manager, Rocky Mountain Arsenal Contamination Cleanup.

- Granau, Lee, Ruggles, Anne, Venner, Marie, Pague, Chris, Rondeau, Renee, and Powell, Jerry. 2003. "Programmatic Biological Assessment, Conference Report, and Conservation Strategy for Impacts from Transportation Improvement Projects on Select Sensitive Species on Colorado's Central Shortgrass Prairie." <https://www.codot.gov/programs/environmental/wildlife/guidelines/shortgrass-prairie-ba-and-conservation-strategy>.
- Hammerson, Geoffrey A. 1999. *Amphibians and Reptiles in Colorado*. University Press of Colorado and Colorado Division of Wildlife.
- Karns, D.R. 1992. "Effects of Acidic Bog Habitats on Amphibian Reproduction in a Northern Minnesota Peatland." *Journal of Herpetology* 26:401–12.
- Martell, M. 1992. "Bald Eagle Winter Management Guidelines." U.S. Fish and Wildlife 21 Service.
- Natural Diversity Information Source. 2021. "Natural Diversity Information Source." Colorado Parks and Wildlife: Colorado Hunting Atlas. 2021. <https://ndismaps.nrel.colostate.edu/index.html?app=HuntingAtlas>.
- Sharps, Jon C., and Daniel W. Uresk. 1990. "Ecological Review of Black-Tailed Prairie Dogs and Associated Species in Western South Dakota." *The Great Basin Naturalist* 50 (4): 339–45.
- U.S. Fish and Wildlife Service. 2003a. "Biological Opinion for the Colorado Shortgrass Prairie Initiative (ES/LK-6-CO-03-F-041) from Susan Linner (Service) to William C. Jones (Federal Highway Administration)."
- . 2003b. "Migratory Bird Permit Memorandum." <https://www.fws.gov/media/mbpm-1-migratory-bird-permit-mbp-memorandum-series>.
- . 2024. "Information for Planning and Consultation (IPaC) Resource List." 2024. <https://ecos.fws.gov/ipac/>.

## **Appendix J: Paleontological Resources**



# WESTERN SLOPE PALEONTOLOGICAL SERVICES



Friday, May 3rd, 2024

RE: Paleontological Resources Impact Evaluation for the RFTA Regional Transit Center and Expansion Project

To whom it may concern,

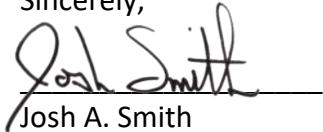
Western Slope Paleontological Services (WSP) performed an analysis of existing paleontological data for the Roaring Fork Transportation Authority "Regional Transit Center and Expansion Project" in Garfield County, Colorado (project area). The analysis included a museum records search consisting of fossil locality data requests made at the University of Colorado Museum of Natural History (UCM) and the Denver Museum of Nature and Science (DMNS), and an online fossil locality records search through the Colorado Office of Archaeology and Historic Preservation Compass online database (Compass). In addition, an online search of geologic maps, scientific literature, and other sources of paleontological data within and near to the project area was undertaken as part of the analysis. Lastly, the Potential Fossil Yield Classification (PFYC) of the project area as designated by the Bureau of Land Management (BLM) was determined.

The 1:24,000-scale "Geologic Map of the Glenwood Springs Quadrangle, Garfield County, Colorado" (Kirkham et al. 2009) shows that the entire project area is situated in Holocene-age "younger debris-flow deposits" (Qdfy). Holocene deposits can contain the unfossilized remains of modern species of animals and plants, however, these deposits are typically too young to contain in situ fossils and are not generally considered to be paleontologically sensitive (Murphey and Daitch 2007). The BLM designates the Holocene deposits in the project area as PFYC 2, indicating geologic units that are "generally younger than 10,000 years old" and "are not likely to contain paleontological resources" (BLM 2016). Management concerns in PFYC 2 units "are generally low and further assessment is usually unnecessary," with standard stipulations usually recommended prior to land development "to accommodate unanticipated discoveries" (BLM 2016).

The UCM, DMNS, and Compass fossil locality searches all returned negative results, as no known fossil localities are known within the project area or within a 1-mile buffer. Also, no literature was found concerning fossil localities within the project area or 1-mile buffer. Hence, the project area is considered to be free of known fossil localities, and no further action concerning paleontological resources is necessary for this project.

Search results are available by request from WSP. Please contact me with this or any other requests/questions at [westslopepaleo@gmail.com](mailto:westslopepaleo@gmail.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Josh Smith", written over a horizontal line.

Josh A. Smith  
Principal/Paleontologist

Citation:

Kirkham, R.M., Streufert, R.K., Cappa, J.A., Shaw, C.A., Allen, J.L., and Schroeder, T.J. II, 2009, Geologic Map of the Glenwood Springs Quadrangle, Garfield County, Colorado, Colorado Geological Survey, Map Series MS-38, 1:24,000.

## **Appendix K: Initial Site Assessment Summary of Environmental Conditions**

|                                                                                      |                               |                                     |
|--------------------------------------------------------------------------------------|-------------------------------|-------------------------------------|
| <b>COLORADO DEPARTMENT OF TRANSPORTATION</b><br><b>INITIAL SITE ASSESSMENT (ISA)</b> | Region: <b>3</b><br>Route ID: | Project No.:<br>Project Code (SA#): |
|--------------------------------------------------------------------------------------|-------------------------------|-------------------------------------|

**Project Description**

Project Name: **Glenwood Maintenance Facility (GMF), Phase 6A, 6B, and 8**  
 Milepost Begin: **NA** Milepost End: **NA** County: **Garfield**  
 Location: **The project area consists of Wulfsohn Road east of the intersection with Midland Avenue, the West Glenwood Park & Ride, and a portion of the parking lot for the RFTA GMF in Glenwood Springs, Colorado. The project area is in the SW quarter of Section 5, Township 6 South, Range 89 West of the 6th Principal Meridian in Garfield County, Colorado.**  
 Main Project Elements: **Phase 6A consists of the construction of the Transit Center, which will be a 6,093 square foot building designed to accommodate needs for passengers and RFTA staff; Phase 6B consists of the construction of a 22,956 square foot building designed to cater to the existing and future needs of the RFTA. This phase also involves development of the parking area, landscaping, and a pedestrian bridge to provide access to Wulfsohn Road; and Phase 8 consists of modifications and construction for a storage building to support RFTA's daily activities.**

**Project Features (Check if applies)**

|                                                         |                                                            |                                               |
|---------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------|
| <input type="checkbox"/> Structure Acquisition          | <input checked="" type="checkbox"/> Structure Modification | <input type="checkbox"/> Structure Demolition |
| <input type="checkbox"/> New ROW                        | <input type="checkbox"/> Easements                         | <input type="checkbox"/> Utility Relocation   |
| <input checked="" type="checkbox"/> Excavation/Drilling | Disturbance depth (if known):      ft                      | <input type="checkbox"/> Dewatering           |
| Gw Anticipated: <b>No</b>                               | Depth to gw (if known):      ft                            | Gw flow direction (if known): <b>N-NW</b>     |

**Records Review & Interview(s)**

The following records/sources were used in this assessment ('No' is implied if unchecked):

☒ ASTM Standard Environmental Record Sources    ☒ OPS    ☒ CDPHE    ☐ CDOT Internal Database Date:  
☒ ASTM Standard Search Radii or ☐ Modified Search Radii:  
☐ Previous Environmental Reports/CDOT Files:  
☒ Other Files/Databases (Assessor, Fire dept., Building, Planning, etc.):

Topographic Map(s)    ☒ Current – date: **2022**    ☒ Historic – year(s): **1961, 1979, 1982, 1987, 2011, 2013, 2016, 2019, 2022**

Aerial Photograph(s)    ☒ Current – date: **2023**    ☒ Historic – year(s): **1955, 1960, 1979, 1983, 1989, 1993, 1999, 2006, 2011, 2015, 2019, 2023**

☐ Sanborn Map(s) – year(s):

☐ Local Street Directories – year(s):

Historic Land use(s) within the project area (if known): **undeveloped land, parking areas, road right-of-way,**

Interviews (Names/Title/Date/Comments):

**Site Reconnaissance & Description**

☐ Visual inspection conducted      Inspection Date:  
 If 'No' document the reason: **Site inspection was not required by project**

Project area and land use(s) description:

**Wulfsohn Road southeast of the intersection with Midland Avenue, the West Glenwood Park & Ride, and portions of the parking lot for the RFTA GMF**

☐ Industrial    ☐ Light Industrial    ☒ Commercial    ☐ Residential    ☐ Agricultural    ☒ Undeveloped    ☒ Other: **parking lots**

Adjacent land use(s) description:

**Undeveloped, Glenwood GMF and Maintenance and Operations Center (MOC)**

☐ Industrial    ☐ Light Industrial    ☒ Commercial    ☐ Residential    ☐ Agricultural    ☒ Undeveloped    ☒ Other: **Glenwood MOC**

**Potential Environmental Concerns on the immediate project area or directly adjacent to it**

(Select from dropdown menu – Yes, No, Expected, or Unknown)

| Potential Environmental Concern                               | Project Area | Adjacent Area | Potential Environmental Concern      | Project Area | Adjacent Area |
|---------------------------------------------------------------|--------------|---------------|--------------------------------------|--------------|---------------|
| Evidence of underground tanks (pipes, vents, fill caps, etc.) | Unknown      | Unknown       | Protected/fenced/placarded area(s)   | Unknown      | Unknown       |
| Aboveground storage tank(s)                                   | Unknown      | Unknown       | Liquid waste (pits, ponds, etc.)     | Unknown      | Unknown       |
| Monitoring/water well(s)                                      | Unknown      | Unknown       | Oil sheen (soil/water)               | Unknown      | Unknown       |
| Electrical/transformer Equipment                              | Unknown      | Unknown       | Oil/gas well(s)                      | Unknown      | Unknown       |
| Cistern(s), sump(s) drain(s)                                  | Unknown      | Unknown       | Mine tailings/waste                  | Unknown      | Unknown       |
| Barrel(s), drum(s), container(s)                              | Unknown      | Unknown       | Painted/preserved material(s)        | Unknown      | Unknown       |
| Stockpile, surface trash, debris                              | Unknown      | Unknown       | Odor                                 | Unknown      | Unknown       |
| Exposed/buried landfill                                       | Unknown      | Unknown       | Chemical storage                     | Unknown      | Unknown       |
| Batteries                                                     | Unknown      | Unknown       | Suspect asbestos containing material | Unknown      | Unknown       |
| Surface staining                                              | Unknown      | Unknown       | Suspected methamphetamine lab        | Unknown      | Unknown       |
| Stressed vegetation                                           | Unknown      | Unknown       |                                      |              |               |

**Findings/Conclusions:**

Are known hazardous or other waste sites on or adjacent to the project area, which may affect the project? **No**  
Explain:

**Recommendations:**

☐ Materials Management Plan    ☐ Force Account    ☐ Modified CDOT Specification(s)    ☐ Additional Assessment/Investigation\*

Explain:

**\*Additional work must be approved by CDOT.****Attachments:**

|                                                                |  |
|----------------------------------------------------------------|--|
| <input checked="" type="checkbox"/> Environmental Database Map |  |
| <input type="checkbox"/> Modified CDOT Specification(s)        |  |
| <input type="checkbox"/> General Plan Note(s)                  |  |
| <input checked="" type="checkbox"/> Maps & Figures             |  |
| <input type="checkbox"/> Agency File Data                      |  |
|                                                                |  |
|                                                                |  |
|                                                                |  |

Completed by (Name and Title): **Courtney Sockwell - Env. Professional with ERO Resources Corp.**Signature: Courtney Sockwell Date: **07/29/2024** Revised (if necessary):

CDOT Environmental Project Manager Approval: \_\_\_\_\_ Date:



Consultants in Natural Resources and the Environment

---

# Initial Site Assessment Summary of Environmental Conditions Roaring Fork Transportation Authority Glenwood Maintenance Facility, Phase 6A, 6B, and 8 Glenwood Springs, Colorado

Prepared for—

Roaring Fork Transportation Authority  
2307 Wulfsohn Road  
Glenwood Springs, Colorado 81601

Prepared by—

ERO Resources Corporation  
1626 Cole Boulevard, Suite 100  
Lakewood, Colorado 80401  
(303) 830-1188  
ERO Project #10851

July 29, 2024



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|----------------------------------|--|

# **Initial Site Assessment Summary of Environmental Conditions Roaring Fork Transportation Authority Glenwood Maintenance Facility, Phase 6A, 6B, and 8 Glenwood Springs, Colorado**

**July 29, 2024**

## **1.0 Introduction**

The Roaring Fork Transportation Authority (RFTA) retained ERO Resources Corporation (ERO) to conduct an Initial Site Assessment (ISA) for the Glenwood Maintenance Facility (GMF), Phases 6A, 6B, and 8 in Glenwood Springs, Colorado (project area). The project area consists of Wulfsohn Road east of the intersection with Midland Avenue, the West Glenwood Park & Ride, and a portion of the parking lot for the RFTA GMF in Glenwood Springs, Colorado (Figure 1). This report presents the findings, opinions, and conclusions of this ISA.

This ISA was performed to satisfy the Work Scope and contract between RFTA and ERO dated April 23, 2023. The conclusions in this report are based on limited observations and investigations described herein at the time this ISA was conducted; future events may alter these findings.

The purpose of the project is to update and build facilities to support future RFTA operations, enhance passenger experience, and increase overall area accessibility.

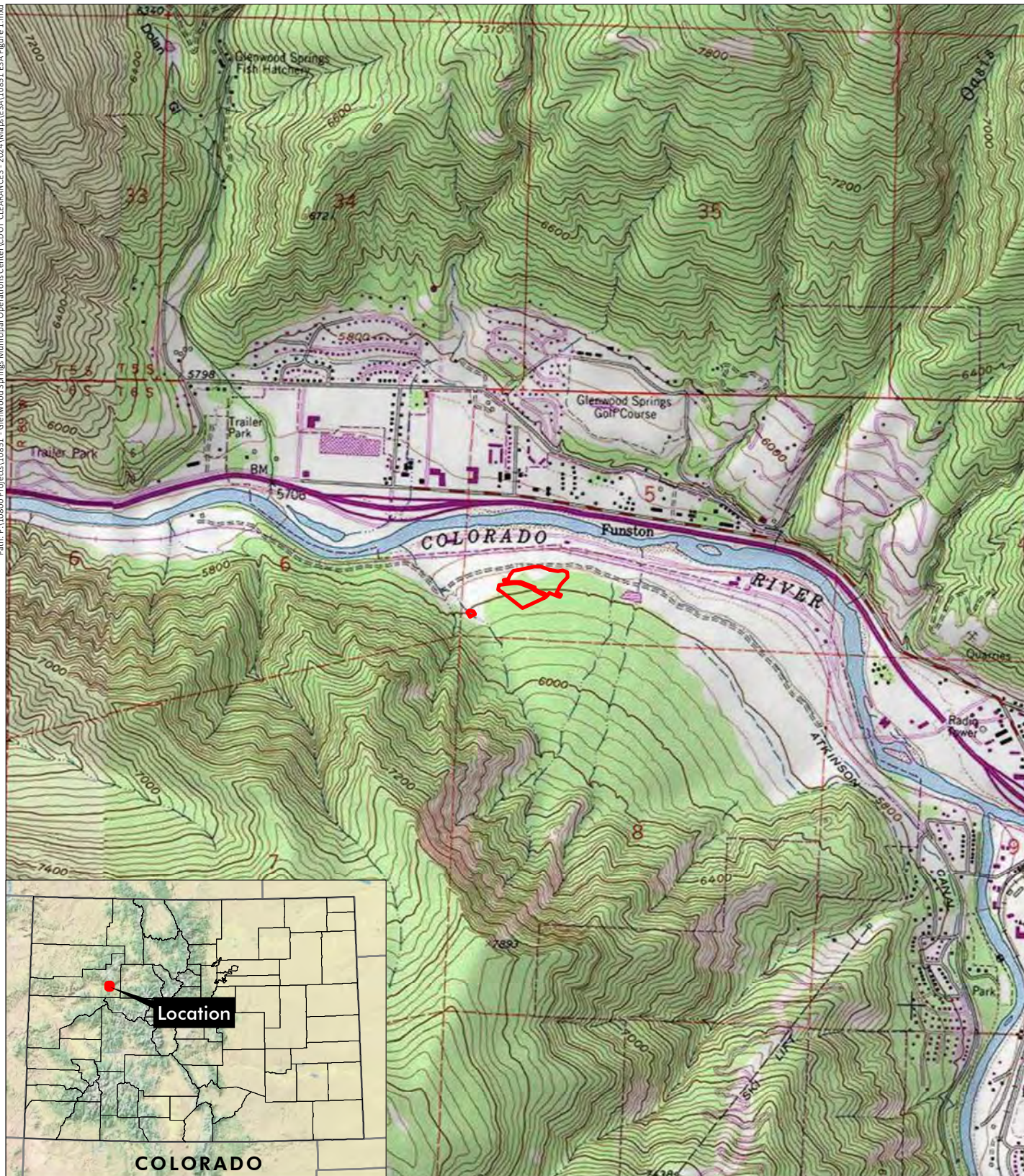
### **1.1 Location**

The project area is in the SW quarter of Section 5, Township 6 South, Range 89 West of the 6th Principal Meridian in Garfield County, Colorado (Figure 1). According to the Garfield County Assessor's Office, the project area consists of Wulfsohn Road, its public rights-of-way (ROW), and portions of three Garfield County parcels all owned by RFTA (Garfield County Assessor's Office 2024).

### **1.2 Site and Vicinity General Characteristics**

The project area consists of Wulfsohn Road southeast of the intersection with Midland Avenue, the West Glenwood Park & Ride, and portions of the parking lot for the RFTA GMF in Glenwood Springs, Colorado. The project area is generally bounded by undeveloped land and former municipal land undergoing construction for the new Glenwood Maintenance and Operations Center (MOC) (Figure 2).





## Glenwood Maintenance Facility, Phases 6A, 6B, and 8, Glenwood Springs, Colorado

Section 5, T6S, R89W; 6th PM

UTM NAD 83: Zone 13N; 297716mE, 4381291mN

Longitude 107.354523°W, Latitude 39.557471°N

USGS Glenwood Springs, CO Quadrangle

Garfield County, Colorado

 Project Area

0 1,000 2,000  
Feet



## Figure 1 Vicinity Map

Prepared for: Shrewsberry &  
Associates, LLC  
File: 10851 ESA Figure 1.mxd (GS)  
July 10, 2024

**ERO**  
ERO Resources Corp.





## Glenwood Maintenance Facility, Phases 6A, 6B, and 8, Glenwood Springs, Colorado

 Project Area Boundary

Image Source: maxar Technologies©, September 27, 2024

0 75 150  
Feet



## Figure 2 Site Plan

Prepared for: Shrewsberry &  
Associates, LLC  
File: 10851 ESA Figure 2.mxd (GS)  
July 10, 2024

**ERO**  
ERO Resources Corp.

## 2.0 Project Description

According to project plans from the RFTA, the general project scope consists of the following three phases (RFTA 2024):

- Phase 6A consists of the construction of the Transit Center, which will be a 6,093 square foot building designed to accommodate needs for passengers and RFTA staff;
- Phase 6B consists of the construction of a 22,956 square foot building designed to cater to the existing and future needs of the RFTA. This phase also involves development of the parking area, landscaping, and a pedestrian bridge to provide access to the newly constructed RFTA Operations Center and Bus Storage Facility, which is located across the access road; and
- Phase 8 consists of modifications and construction for a storage building to support RFTA's daily activities.

Based on current available information regarding the proposed project, the maximum depth of excavation in the project area is unknown. Based on groundwater levels identified in environmental reports for sites adjoining the project area, groundwater is not anticipated to be encountered during construction. Permanent or temporary easements and/or right-of-way acquisition will not be necessary.

## 3.0 Physical Setting

The elevation of the project area ranges from 5,790 to 5,850 feet above sea level (U.S. Geological Survey [USGS] 2024). Surface geology in the area is characterized by alluvial deposits of sand and gravel underlain by gypsum, anhydrite, and interbedded siltstone and minor dolomites of the Eagle Valley Evaporite (Tweto, Moench, and Reed Jr., 1978). According to a 2023 Site Characterization Report (SCR) prepared by TAIT Environmental Services, Inc. (TAIT), for the former RFTA MOC located adjoining to the south of the project area, groundwater in the vicinity of the project area was not encountered in soil borings up to 25 feet bgs (TAIT 2023). According to topographic information from the USGS 7.5-minute quadrangle map, surface water in the project area flows to the north-northwest, toward the Colorado River (USGS 2024). Based on the topography and field observations, the expected flow direction of the uppermost groundwater is to the north-northwest, toward the Colorado River.

## 4.0 Historical Review

### 4.1 Historical Use Information for the Project Area and Adjoining Properties

ERO used the following standard historical sources to evaluate current and past uses of the project area and adjoining properties:

- Historical aerial photographs from 1955 to 2023
- Historical topographic maps from 1961 to 2022



Other standard historical sources for the site, such as street directories, project area tax files, recorded land title records, building department records, and zoning/land use records, were not reasonably ascertainable, were not available, or, based on ERO's professional experience, are unlikely to be sufficiently useful, accurate, or complete and are unlikely to provide significant additional historical information with regard to the project area.

#### **4.1.1 Historical Aerial Photographs**

Historical aerial photographs from 1955 to 2023 showing the project area and surrounding area were reviewed and are discussed below (Environmental Data Resources [EDR] 2024a; Google Earth 2024).

##### **1955 and 1960 Aerial Photographs; Scale: 1 inch=500 feet**

The 1955 and 1960 aerial photographs show the project area and surrounding area to be undeveloped. A portion of the land northwest of the project area is developed for agricultural purposes. The Colorado River is visible north of the project area. U.S. Highway 6 (Highway 6) is visible north of the Colorado River. Several buildings are visible north of Highway 6.

##### **1979 Aerial Photograph; Scale: 1 inch=500 feet**

No significant changes to the project area are visible in the 1979 aerial photograph compared with the previous photograph. Significant changes to the surrounding area consist of the following:

- The Denver and Rio Grande Great Western Railroad (D&R GW RR) is visible north of the project area;
- Road construction is visible north of the Colorado River for U.S. Interstate 70 (I-70); and
- Development north of the Colorado River continues.

##### **1983 Aerial Photograph; Scale: 1 inch=500 feet**

No significant changes to the project area are visible in the 1983 aerial photograph compared with the previous photograph. Significant changes to the surrounding area consist of the following:

- Two new buildings and several roads are visible north of the project area, between the D&R GW RR and the Colorado River;
- I-70 is complete; and
- Development north of the Colorado River continues.

##### **1989 and 1993 Aerial Photographs; Scale: 1 inch=500 feet**

No significant changes to the project area or surrounding area are visible in the 1989 and 1993 aerial photographs compared with the previous photograph.

##### **1999 Aerial Photograph; Scale: 1 inch=500 feet**

No significant changes to the project area are visible in the 1999 aerial photograph compared with the previous photographs. Significant changes to the surrounding area consist of the following:

- Midland Avenue is visible north of the project area; and
- Development is visible between the D&R GW RR and the Colorado River.

**2006 Aerial Photograph; Scale: 1 inch=500 feet**

Significant changes to the project area and surrounding area in the 2006 aerial photograph compared with the previous photograph consist of the following:

- The Glenwood Springs MOC, administration buildings, and associated parking lots are visible on and adjoining the project area;
- The RFTA park and ride lot is visible on and adjoining the project area;
- Wulfsohn Road is visible crossing the project area;
- Grading is visible adjoining the project area to the east;
- A dirt road and an excavated sediment trench are visible southeast of the project area; and
- Several commercial office buildings are visible north and east-southeast of the project area.

**2011 Aerial Photograph; Scale: 1 inch=500 feet**

Significant changes to the project area and surrounding area in the 2011 aerial photograph compared with the previous photograph consist of the following:

- Soil disturbance is visible in the central and northern portions, as well as adjoining the northern portion of the project area.

**2015 Aerial Photograph; Scale: 1 inch=500 feet**

No significant changes to the project area or surrounding area are visible in the 2015 aerial photograph compared with the previous photograph.

**2019 Aerial Photograph; Scale: 1 inch=500 feet**

Significant changes to the project area and surrounding area in the 2019 aerial photograph compared with the previous photograph consist of the following:

- A parking lot and bus loop are visible in the central portion of the project area;
- Soil disturbance is visible in the northeast portion of the project area; and
- A concrete walking path is visible north of the project area.

**2023 Aerial Photograph; Google Earth; Scale Variable**

Significant changes to the project area and surrounding area in the 2023 aerial photograph compared with the previous photograph consist of the following:

- Soil disturbance and grading associated with the decommissioning of the former Vehicle Maintenance and Operations Center is visible on and adjoining the project area; and
- A dirt/gravel parking lot is visible in the northeast portion of the project area.

**4.1.2 Historical Topographic Maps**

Historical USGS topographic maps from 1961 to 2022 showing the project area and surrounding area were reviewed and are discussed below (USGS 2024).

**1961 USGS 7.5-Minute Series, Glenwood Springs Quadrangle, CO; Scale: 1:24,000**

The USGS topographic map from 1961 shows the project area and surrounding area to be undeveloped. An unnamed road is shown north of the project area. Multiple drainages are shown east and west of the project area, draining toward the Colorado River north of the project area.

**1979 and 1982 USGS 7.5-Minute Series, Glenwood Springs Quadrangle, CO; Scale: 1:24,000**

No significant changes to the project area are shown on the USGS topographic maps from 1979 and 1982 compared with the previous map. Significant changes to the surrounding area consist of the following:

- The D&R GW RR is visible north of the project area;
- An area of fill is shown east of the project area; and
- I-70 is shown north of the Colorado River.

**1987 USGS 7.5-Minute Series, Glenwood Springs Quadrangle, CO; Scale: 1:24,000**

No significant changes to the project area are shown on the USGS topographic map from 1987 compared with the previous map. Significant changes to the surrounding area consist of the following:

- Several new buildings, a road, and a bridge are shown north of the Colorado River.

**2011, 2013, 2016, 2019, and 2022 USGS 7.5-Minute Series, Glenwood Springs Quadrangle, CO; Scale: 1:24,000**

The 2011, 2013, 2016, 2019, and 2022 USGS topographic maps, with corresponding aerial photograph base maps, show the subject property and surrounding area as they appeared in the aerial photographs for the same period discussed above.

## 5.0 Records Review

### 5.1 Standard Environmental Records Sources

ERO contracted with a commercial database search company, EDR, to conduct a search of publicly available database records (EDR 2024b). All ASTM International (ASTM) search distance sites are measured from the project area boundary.

ERO reviewed initial search results for inaccuracies using both field and mapping data sources. In addition, ERO attempted to locate orphan sites, those that lack adequate location information to map, using zip code, city name, site name, or other information. No orphan sites were found to be within the approximate ASTM search distances. Sites identified in the surrounding area are discussed in the following sections and assessed as to their potential to be historical, known, or suspect environmental concerns associated with the project area. A summary is included in Table 1, and copies of records reviewed are in Appendix A.

**Table 1. Summary of publicly available environmental records.**

| Record Sources                 | Search Distance (miles) <sup>1</sup> | Project Area | No. of Sites in Surrounding Area |
|--------------------------------|--------------------------------------|--------------|----------------------------------|
| Federal NPL site list          | 1.0                                  | No           | 0                                |
| Federal Delisted NPL site list | 0.5                                  | No           | 0                                |

| Record Sources                                                                                                           | Search Distance (miles) <sup>1</sup> | Project Area | No. of Sites in Surrounding Area |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------|----------------------------------|
| Federal Superfund Enterprise Management System (SEMS) list                                                               | 0.5                                  | No           | 0                                |
| Federal SEMS-Archive site list                                                                                           | 0.5                                  | No           | 0                                |
| Federal Resource Conservation and Recovery Act (RCRA) Corrective Action (RCRA) Corrective Action site list               | 1.0                                  | No           | 1                                |
| Federal RCRA Treatment, Storage, and Disposal (TSD) facilities list                                                      | 0.5                                  | No           | 0                                |
| Federal RCRA generators list                                                                                             | Project area and adjoining           | Yes          | 1                                |
| Federal institutional control/engineering control registries                                                             | Project area only                    | No           | 0                                |
| Federal Emergency Response Notification System list                                                                      | Project area only                    | No           | 0                                |
| State NPL-equivalent sites <sup>2</sup>                                                                                  | 1.0                                  | No           | 0                                |
| State Comprehensive Environmental Response, Compensation, and Liability Information System-equivalent sites <sup>2</sup> | 0.5                                  | No           | 0                                |
| State landfill and/or solid waste disposal site list                                                                     | 0.5                                  | No           | 2                                |
| State leaking storage tank list                                                                                          | 0.5                                  | Yes          | 8                                |
| State registered storage tank list                                                                                       | Project area and adjoining           | Yes          | 2                                |
| State institutional control/engineering control registries                                                               | Project area only                    | No           | 0                                |
| State Voluntary Cleanup Program sites                                                                                    | 0.5                                  | No           | 0                                |
| State Brownfields sites                                                                                                  | 0.5                                  | No           | 0                                |
| State Historical Cleaners                                                                                                | Project area and adjoining           | No           | 0                                |

<sup>1</sup>ASTM E1527 standard search distances.

<sup>2</sup>In Colorado, the lead agency for National Priorities List (NPL)/CERCLA may be either the Environmental Protection Agency or the Colorado Department of Public Health and Environment (CDPHE).

### 5.1.1 Federal Resource Conservation and Recovery Act Corrective Action Site List

The federal Resource Conservation and Recovery Act (RCRA) Corrective Action Site (CORRACTS) List provides a list of sites that have had or are undergoing corrective action or cleanup pursuant to the RCRA. One corrective action site is within 1 mile of the project area (Table 2) and is discussed further in section 5.2.1.

**Table 2. Summary of corrective action sites within one mile of the project area.**

| Site Name            | Address            | Status                              | Distance and Direction           |
|----------------------|--------------------|-------------------------------------|----------------------------------|
| EIMCO Coal Machinery | 2222 Devereux Road | Received regulatory closure in 2000 | 0.19 mile NW of the project area |

### 5.1.2 Federal Resource Conservation and Recovery Information System

The Resource Conservation and Recovery Information System (RCRIS) includes two lists: (1) facilities on which treatment, storage, and/or disposal (TSD) of hazardous wastes occur; and (2) persons or entities that generate hazardous waste as defined and regulated by the RCRA. According to these lists, no TSD facilities are located within 0.5 mile of the project area, and the RFTA GMF site is located on and adjoining the project area. The RFTA GMF site is listed as a very-small quantity generator (VSQG) of nonhalogenated solvents and has no records of violations.

### 5.1.3 State Landfill and Solid Waste Disposal Sites

The CDPHE lists no permitted landfills and two other solid waste disposal sites within 0.5 mile of the project area (Table 3).

**Table 3. Solid waste disposal sites within 0.5 mile of the project area.**

| Site Name                             | Address         | Status               | Distance and Direction          |
|---------------------------------------|-----------------|----------------------|---------------------------------|
| Discount Tire                         | 51537 Highway 6 | Waste tire generator | 0.20 mile N of the project area |
| MCD Automotive Interests Colorado LLC | 51429 Highway 6 | Waste tire generator | 0.23 mile N of the project area |

#### **5.1.4 State Leaking Storage Tank Sites**

The Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS) lists no leaking underground storage tank (LUST) or leaking aboveground storage tank (LAST) site in the project area. Eight LUST or LAST sites are located within 0.5 mile of the project area (Table 4). The RFTA GMF site and Glenwood MOC site are discussed further in section 5.2.3.

**Table 4. LUST or LAST sites within 0.5 mile of the project area.**

| Site Name                                                                      | Address            | Status                                 | Distance and Direction                                         |
|--------------------------------------------------------------------------------|--------------------|----------------------------------------|----------------------------------------------------------------|
| Roaring Fork Transportation Authority Glenwood Maintenance Facility (RFTA GMF) | 2307 Wulfsohn Road | Four event IDs, all closed             | Adjoining the project area                                     |
| Glenwood Springs Municipal Operations Center (MOC)                             | 2301 Wulfsohn Road | Closed                                 | Adjoining the project area to the south                        |
| EZ Way Rentals, Inc.                                                           | 51527 US Highway 6 | Two event IDs, both closed             | 0.21 mile N of the project area and across the Colorado River  |
| Rey Motors, Inc                                                                | 51457 Highway 6    | Closed                                 | 0.24 mile N of the project area and across the Colorado River  |
| 7-11 #17211                                                                    | 51315 Highway 6    | Closed                                 | 0.27 mile N of the project area and across the Colorado River  |
| Alta Convenience #6318                                                         | 51171 Highway 6    | Closed                                 | 0.39 mile NW of the project area and across the Colorado River |
| Alta Convenience #6020                                                         | 23 Mel Rey Road    | Four event IDs, undergoing remediation | 0.42 mile NW of the project area and across the Colorado River |
| West Carwash                                                                   | 77 Mel Rey Road    | Closed                                 | 0.46 mile NW of the project area and across the Colorado River |

#### **5.1.5 State Registered Storage Tank Sites**

CDLE/OPS lists the RFTA and Glenwood Springs Municipal Operations Center storage tank sites in and adjoining the project area (Table 5).

**Table 5. Registered storage tank sites in and adjoining the project area.**

| Site/Address                                                       | Tanks/Status                                                                                                                                                                                          | Location/Direction                      |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Roaring Fork Transportation Authority<br>2307 Wulfsohn Road        | 1 15,000-gallon Diesel UST/In use<br>1 6,000-gallon Gasoline UST/In use<br>1 3,000-gallon Gasoline UST/In use<br>1 1,000-gallon Used Oil UST/In use<br>1 2,000-gallon Diesel AST/Pending installation | Adjoining the project area              |
| Glenwood Springs Municipal Operations Center<br>2301 Wulfsohn Road | 1 12,000-gallon Gasoline/Diesel AST/Closed                                                                                                                                                            | Adjoining the project area to the south |

## 5.2 Additional Environmental Records Sources

### 5.2.1 Colorado Department of Public Health and Environment

ERO reviewed the CDPHE Hazardous Materials and Waste Management Division online mapping application for any known sites that may indicate environmental concerns in or near the project area. The RFTA GMF was identified as a CDLE/OPS LUST site, as well as a VSQG on and adjoining the project area. This site is discussed in Section 5.1.4, Section 5.1.5 and Section 5.2.3. In addition, the EIMCO Coal Machinery corrective action site was identified in the surrounding area. This site is discussed in Section 5.1.1 and below (CDPHE 2024).

**EIMCO Coal Machinery, 2222 Devereux Road.** The EIMCO Coal Machinery site, at 2222 Devereux Road, is about 0.19-mile northwest of the project area. The site is a former chromium plating facility for mining tools that identified a hexavalent chromium release during a site assessment in 1992 (Foremost Solutions, Inc. [FMI] 2000). An onsite pit containing the electroplating tanks had leaked, resulting in elevated hexavalent chromium levels in the surrounding soil and groundwater. The pit and surrounding soils were excavated and removed (FMI 2000). Depth to water measurements in five monitoring wells from June of 1999 through April of 2000 for the site showed groundwater at depths from 18-32 feet bgs with a groundwater flow direction to the north-northwest, toward the Colorado River and away from the project area (FMI 2000). Following the installation of a recirculating anaerobic bioremediation system and a chemical reducing agent, groundwater concentrations were observed to be below state standards (FMI 2000). FMI submitted a No Further Action Request for this site in April of 2000 (FMI 2000), and CDPHE granted the site regulatory closure on May 1, 2000 (CDPHE 2000).

### 5.2.2 Colorado Energy and Carbon Management Commission Records

ERO reviewed records maintained by the Colorado Energy and Carbon Management Commission (CECMC), the agency that regulates oil and natural gas exploration and production in Colorado. According to the CECMC, no oil and gas wells are on or near the project area (CECMC 2024).



### **5.2.3 Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS)**

ERO reviewed records maintained by CDLE/OPS for the RFTA GMF site located at 2307 Wulfsohn Road, as well as the former Glenwood Springs MOC site at 2301 Wulfsohn Road.

**RFTA GMF, 2307 Wulfsohn Road.** The RFTA GMF has four closed releases associated with the site. Per a 2006 Storage Tank Report and Release Tracking Form, an overspill of about three gallons occurred at the diesel tank (RFTA 2006), and during a follow-on inspection, it was found that overfill protection systems on three of the USTs were compromised (CDLE/OPS 2006). According to the 2007 Site Characterization Report (SCR) prepared by Waste Engineering, Inc (WEI), as part of the site characterization report, soil sampling was requested (WEI 2007a). Soil samples collected from beneath the tanks contained very low levels of petroleum hydrocarbons; groundwater was not encountered, and therefore, was not sampled (WEI 2007a). CDLE/OPS granted the site regulatory closure on May 10, 2007 (CDLE/OPS 2007a).

ERO also reviewed a second 2007 SCR for a release in October of 2007, also prepared by WEI. During the replacement of overfill protection equipment on the 3,000-gallon motor oil tank, an OPS inspector suspected a release and requested sampling and analysis of soils associated with the UST (WEI 2007b). The single soil sample analyzed contained petroleum hydrocarbons at levels below CDLE/OPS Tier-I Risk-Based Screening Levels (RBSLs), groundwater was not encountered; and therefore, was not sampled (WEI 2007b). CDLE/OPS granted the site regulatory closure on November 14, 2007 (CDLE/OPS 2007b).

Additionally, ERO reviewed a 2019 Minor Equipment Repair/Replacement Notification prepared by Palisades Technology and Management, LLC (PTM), stating that during spill bucket testing, a fill pipe could not be removed at the onsite gasoline and diesel USTs. During follow-on repair work for the fill pipes and spill buckets, no evidence of contamination was observed (PTM 2019). CDLE/OPS granted regulatory closure to the site on March 6, 2020 (CDLE/OPS 2020).

ERO also reviewed a 2023 SCR prepared by TAIT stating that a piping sump test failure had occurred (TAIT 2023). Soil borings to 25 feet were conducted and sampled, and the results showed no petroleum hydrocarbon concentrations above laboratory reporting limits (TAIT 2023); groundwater was not encountered, and therefore, was not sampled (TAIT 2023). CDLE/OPS granted the site regulatory closure on October 11, 2023 (CDLE/OPS 2023).

**Glenwood Springs MOC, 2301 Wulfsohn Road.** ERO reviewed the July 30, 2021, SCR prepared by ERO stating that a 12,000-gallon combination gasoline/diesel fuel AST and two fuel dispensers were removed (ERO 2021). Soil samples were taken from beneath the tank and the dispenser island. Low levels of diesel range organics and oil range organics were found in all samples beneath the AST, well below CDLE/OPS Tier I RBSLs, and no petroleum hydrocarbon concentrations were detected above laboratory reporting limits in the samples beneath the fuel dispensers (ERO 2021). The CDLE/OPS granted the site regulatory closure on September 24, 2021 (CDLE/OPS 2021).

### **5.2.4 Colorado Division of Water Resources**

ERO reviewed records maintained by the Colorado Division of Water Resources (CDWR) for the project area. The CDWR has no records of water wells in the project area (CDWR 2024).

## **5.3 Interviews with Local Government Officials**

### **5.3.1 Local Health Department**

ERO contacted Garfield County on June 13, 2024 for information that may indicate environmental concerns in or near the project area. Mary Lynn Stevens, paralegal with Garfield County Attorney's Office, indicated that Garfield County does not have any responsive records for the project area (Stevens 2024).

### **5.3.2 Local Fire Department**

ERO contacted the City of Glenwood Springs on June 13, 2024 for information that may indicate environmental concerns in or near the project area. Ryan Muse, city clerk with City of Glenwood Springs, indicated that there are multiple response records to the project area, none of which are environmentally relevant (Muse 2024).

## **6.0 Site Reconnaissance**

A site reconnaissance was not required for this ISA and therefore, ERO did not conduct a site reconnaissance of the project area.

## **7.0 Evaluation**

### **7.1 Findings**

The project area consists of Wulfsohn Road southeast of the intersection with Midland Avenue, the West Glenwood Park & Ride, and portions of the parking lot for the RFTA GMF in Glenwood Springs, Colorado. The project area is generally bounded by undeveloped land and former municipal land undergoing construction for the new Glenwood MOC.

Federal, state, and local records identified the following sites or incidents typically associated with environmental concerns in or near the project area:

- 8 LUST or LAST sites in the surrounding area;
- 2 registered storage tank sites adjoining the project area;
- 1 VSQG adjoining the project area;
- 1 corrective action site; and
- 2 solid waste disposal sites.

## 7.2 Opinion

A summary of identified findings and ERO's determination if the findings constitute environmental concerns associated with the project area is presented in Table 6.

**Table 6. Findings and opinions summary.**

| Finding                                                                                                                                                                                                                                                                                                                                    | Environmental Concern | Rationale                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Sites identified in the surrounding area:</p> <ul style="list-style-type: none"><li>• 8 LUST or LAST sites in the surrounding area</li><li>• 2 registered storage tank sites adjoining the project area</li><li>• 1 VSQG adjoining the project area</li><li>• 1 corrective action site</li><li>• 2 solid waste disposal sites</li></ul> | No                    | The sites have received regulatory closure, are located hydrologically crossgradient to downgradient of the project area, are located too far away to adversely impact the project area or have no indication of having contributed to shallow soil contamination in the project area; groundwater is not anticipated to be encountered as part of the project. |

## 7.3 Conclusions and Recommendations

This assessment has revealed no environmental concerns in connection with the project area.

## 8.0 References

- Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS). 2006. Suspected Release: 15558- Roaring Fork Transit Agency. November 2.
- Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS). 2007a. Petroleum Storage Tanks at the Roaring Fork Transit Agency, 2307 Wulfsohn Road, Glenwood Springs, Garfield County, Colorado. Event ID #10241. May 10.
- Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS). 2007b. The suspected release during the replacement of overfill protection at the Roaring Fork Transportation Authority, 2307 Wulfsohn Road, Glenwood Springs, Garfield County, Colorado. Event ID #10428. November 14.
- Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS). 2020. No Further Action Determination for RFTA-Roaring Fork Transit Agency, 2307 Wulfsohn Road, Glenwood Springs, Garfield County, Colorado. Event ID #13464, Facility ID #15558. March 6.
- Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS). 2021. No Further Action Determination for Glenwood Municipal Operations Center, 2301 Wulfsohn Rd., Glenwood Springs, Garfield County, Colorado. Event ID #13987, Release ID #6194, Facility ID #15748. September 24.
- Colorado Department of Labor and Employment, Division of Oil and Public Safety (CDLE/OPS). 2023. No Further Action Determination for Roaring Fork Transit Agency, 2307 Wulfsohn Rd., Glenwood Springs, Garfield County, Colorado. Event ID #17254, Release ID #16242, Facility ID #15558. October 11.
- Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division (HMWMD). 2024. Environmental records Search. <https://cdphe.colorado.gov/hm/gis-data>. Last accessed June 19.
- Colorado Department of Public Health and Environment (CDPHE). 2000. Cleanup of Chromium Contamination, EIMCO/Glenwood Industrial, LLC Site, 2222 Devereux Road, Glenwood Springs, COD981544786. May 1.
- Colorado Division of Water Resources (CDWR). 2024. HydroBase mapping application. <https://dwr.colorado.gov/services/data-information/gis>. Last accessed June 19.
- Colorado Energy and Carbon Management Commission (CECMC). 2024. Review of on-line database. <https://ecmc.state.co.us/maps.html#/gisonline>. Last accessed June 19.
- Environmental Data Resources (EDR). 2024b. The EDR Radius Map Report™ with GeoCheck®. Glenwood Springs Municipal Operations Center, 2302 Wulfsohn Road, Glenwood Springs, CO 81601. Inquiry # 07666145.2r. May 30.
- Environmental Data Resources (EDR). 2024a. The EDR Aerial Photo Decade Package, Glenwood Springs Municipal Operations Center, 2302 Wulfsohn Road, Glenwood Springs, CO 81601. Inquiry #7666145.5. Photo dates: 1955, 1960, 1979, 1983, 1989, 1993, 1999, 2006, 2011, 2015 and 2019. May 31.
- ERO Resources Corporation (ERO). 2021. SCR-No Further Action Request. Former Glenwood Springs Municipal Operations Center, 2301 Wulfsohn Road, Glenwood Springs, Colorado. July 30.

- Foremost Solutions, Inc. (FMI). 2000. Results of Semiannual Groundwater Monitoring. Progress Report on Voluntary Cleanup at the Former EIMCO facility in Glenwood Springs, Colorado. Request for No Further Action Letter and Well Closure. April 17.
- Garfield County Assessor's Office. 2024. Online mapping application.  
<https://qpublic.schneidercorp.com/Application.aspx?AppID=1038&LayerID=22381&PageTypeID=1&PageID=9444>. Last accessed June 19.
- Google Earth. 2024. Aerial photography. [www.googleearth.com](http://www.googleearth.com). Photo date: 6/7/2023. Last accessed June 19.
- Muse, Ryan. 2024. City of Glenwood Springs. Results of search of department files. June 13.
- Palisades Technology and Management, LLC (PTM). 2019. Spill Bucket Repair Assessment, RFTA Maintenance Facility, Glenwood Springs, Colorado 81601. November 11.
- Roaring Fork Transportation Authority (RFTA). 2006. Storage Tank Report and Release Tracking Form. November 3.
- Roaring Fork Transportation Authority (RFTA). 2024. Glenwood Maintenance Facility Expansion, W.G. Transit Center & Administration Offices, Phase 6-Phase 8, Glenwood Springs, Colorado, 100% Schematic Design Narrative. February 23.
- Stevens, Mary Lynn. 2024. Garfield County. Letter documenting results of review of department files. June 13.
- TAIT Environmental Services, Inc. (TAIT). 2023. Site Characterization Report & No Further Action Request. Roaring Fork Transportation Authority, 2307 Wulfsohn Road, Glenwood Springs, Colorado 81601. April 25.
- Tweto, Ogden; Moench, Robert H., and Reed Jr., John C. 1978. Geologic Map of the Leadville 1° by 2° Quadrangle, Northwestern Colorado. Map I-999.
- U.S. Geological Survey (USGS). 2023. Topographic map viewer.  
<https://ngmdb.usgs.gov/topoview/viewer/#8/39.682/-104.691>. Map dates: 7.5-Minute Series, Glenwood Springs Quadrangle, 1961, photorevised 1982 and 1987 Orthophotographic Quadrangle, 2010, 2013, 2016, 2019, and 2022. Denver, CO. Last accessed June 19.
- Waste Engineering, Inc. (WEI). 2007a. Site Characterization Report for Roaring Fork Transportation Authority, 2307 Wulfsohn Rd, Glenwood Springs, Colorado 81601. April 24.
- Waste Engineering, Inc. (WEI). 2007b. Site Characterization Report for Roaring Fork Transportation Authority, 2307 Wulfsohn Rd, Glenwood Springs, Colorado 81601. October 22.

## **Appendix A Environmental Records**



**Glenwood Springs Municipal Operations Center**

2302 Wulfsohn Rd

Glenwood Springs, CO 81601

Inquiry Number: 07666145.2r

May 30, 2024

## The EDR Radius Map™ Report with GeoCheck®



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
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*Thank you for your business.*  
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## EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

### TARGET PROPERTY INFORMATION

#### ADDRESS

2302 WULFSOHN RD  
GLENWOOD SPRINGS, CO 81601

#### COORDINATES

Latitude (North): 39.5578380 - 39° 33' 28.21"  
Longitude (West): 107.3544640 - 107° 21' 16.07"  
Universal Transverse Mercator: Zone 13  
UTM X (Meters): 297717.2  
UTM Y (Meters): 4381122.0  
Elevation: 5793 ft. above sea level

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 50011540 GLENWOOD SPRINGS, CO  
Version Date: 2022  
  
West Map: 50011641 STORM KING MOUNTAIN, CO  
Version Date: 2022

### AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from: 20190913  
Source: USDA

# MAPPED SITES SUMMARY

Target Property Address:  
2302 WULFSOHN RD  
GLENWOOD SPRINGS, CO 81601

Click on Map ID to see full detail.

| MAP ID              | SITE NAME            | ADDRESS              | DATABASE ACRONYMS                        | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---------------------|----------------------|----------------------|------------------------------------------|--------------------|----------------------------|
| <a href="#">A1</a>  | WEST GLENWOOD SPRING | 2302 AND 2307 WULFSO | FINDS, ECHO                              |                    | TP                         |
| <a href="#">A2</a>  | WEST GLENWOOD SPRING | 2302 AND 2307 WULFSO | NPDES                                    |                    | TP                         |
| <a href="#">B3</a>  | RFTA - ROARING FORK  | 2307 WULFSOHN RD     | LUST, LTANKS, UST, AST                   | Lower              | 3, 0.001,                  |
| <a href="#">B4</a>  | ROARING FORK TRANSPO | 2307 WULFSOHN RD     | RCRA-VSQG, FINDS, ECHO                   | Lower              | 3, 0.001,                  |
| <a href="#">5</a>   | EIMCO COAL MACHINERY | 2222 DEVERUEX ROAD   | CORRACTS, RCRA NonGen / NLR, FINDS, ECHO | Lower              | 1002, 0.190, NW            |
| <a href="#">C6</a>  | DISCOUNT TIRE        | 51537 HWY 6          | SHWF                                     | Lower              | 1063, 0.201, North         |
| <a href="#">C7</a>  | GLENWOOD SPRINGS CHR | 51537 HWY 6          | AST                                      | Lower              | 1063, 0.201, North         |
| <a href="#">C8</a>  | E-Z WAY RENTALS INC  | 51517 US HWY 6 & 24  | UST FINDER                               | Lower              | 1070, 0.203, North         |
| <a href="#">9</a>   | SALLY BEAUTY SUPPLY  | 20 MARKET ST UNIT C  | RCRA-VSQG                                | Lower              | 1095, 0.207, NNE           |
| <a href="#">D10</a> | E-Z WAY RENTALS INC  | 51517 US HWY 6 & 24  | UST                                      | Lower              | 1123, 0.213, North         |
| <a href="#">D11</a> | EZ WAY RENTALS INC   | 51527 US HWY 6       | LTANKS                                   | Lower              | 1140, 0.216, North         |
| <a href="#">12</a>  | MCD AUTOMOTIVE INTER | 51429 HWY 6          | SHWF                                     | Lower              | 1212, 0.230, NNW           |
| <a href="#">D13</a> | REY MOTORS INC       | 51457 HWY 6 & 24     | UST FINDER, UST FINDER RELEASE           | Lower              | 1279, 0.242, North         |
| <a href="#">14</a>  | 7-ELEVEN #17211      | 51315 HWY 6          | UST FINDER, UST FINDER RELEASE           | Lower              | 1446, 0.274, NW            |
| <a href="#">E15</a> | ALTA CONVENIENCE #63 | 51171 HWY 6 & 24     | LTANKS, LUST, UST, ASBESTOS              | Lower              | 2045, 0.387, NW            |
| <a href="#">E16</a> | ALTA CONVENIENCE #60 | 23 MEL REY RD        | UST FINDER, UST FINDER RELEASE           | Lower              | 2224, 0.421, NW            |
| <a href="#">E17</a> | 23 MEL REY           | 23 MEL REY RD        | LUST, LUST TRUST                         | Lower              | 2224, 0.421, NW            |
| <a href="#">E18</a> | 23 MEL REY           | 23 MEL REY RD        | LTANKS, UST                              | Lower              | 2224, 0.421, NW            |
| <a href="#">F19</a> | WEST CARWASH         | 77 MEL REY RD        | UST FINDER, UST FINDER RELEASE           | Lower              | 2409, 0.456, NW            |
| <a href="#">F20</a> | WEST CARWASH         | 77 MEL REY RD        | LTANKS, LUST, UST                        | Lower              | 2409, 0.456, NW            |

## EXECUTIVE SUMMARY

### TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

| Site                                                                       | Database(s)                                                                  | EPA ID |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------|--------|
| WEST GLENWOOD SPRING<br>2302 AND 2307 WULFSO<br>GLENWOOD SPRINGS, CO 81601 | FINDS<br>Registry ID:: 110067620756<br><br>ECHO<br>Registry ID: 110067620756 | N/A    |
| WEST GLENWOOD SPRING<br>2302 AND 2307 WULFSO<br>GLENWOOD SPRINGS, CO 81601 | NPDES<br>Permit Number: COR404041                                            | N/A    |

### DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

### STANDARD ENVIRONMENTAL RECORDS

#### ***Lists of Federal NPL (Superfund) sites***

NPL..... National Priority List  
Proposed NPL..... Proposed National Priority List Sites  
NPL LIENS..... Federal Superfund Liens

#### ***Lists of Federal Delisted NPL sites***

Delisted NPL..... National Priority List Deletions

#### ***Lists of Federal sites subject to CERCLA removals and CERCLA orders***

FEDERAL FACILITY..... Federal Facility Site Information listing  
SEMS..... Superfund Enterprise Management System

#### ***Lists of Federal CERCLA sites with NFRAP***

SEMS-ARCHIVE..... Superfund Enterprise Management System Archive

#### ***Lists of Federal RCRA TSD facilities***

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

#### ***Lists of Federal RCRA generators***

RCRA-LQG..... RCRA - Large Quantity Generators

## EXECUTIVE SUMMARY

RCRA-SQG..... RCRA - Small Quantity Generators

### ***Federal institutional controls / engineering controls registries***

LUCIS..... Land Use Control Information System

US ENG CONTROLS..... Engineering Controls Sites List

US INST CONTROLS..... Institutional Controls Sites List

### ***Federal ERNS list***

ERNS..... Emergency Response Notification System

### ***Lists of state- and tribal hazardous waste facilities***

SHWS..... This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

### ***Lists of state and tribal landfills and solid waste disposal facilities***

SWF/LF..... Solid Waste Sites & Facilities

### ***Lists of state and tribal leaking storage tanks***

LAST..... Leaking Aboveground Storage Tank Listing

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

### ***Lists of state and tribal registered storage tanks***

FEMA UST..... Underground Storage Tank Listing

INDIAN UST..... Underground Storage Tanks on Indian Land

### ***State and tribal institutional control / engineering control registries***

AUL..... Environmental Covenants and Environmental Use Restrictions List

### ***Lists of state and tribal voluntary cleanup sites***

VCP..... Voluntary Cleanup & Redevelopment Act Application Tracking Report

INDIAN VCP..... Voluntary Cleanup Priority Listing

### ***Lists of state and tribal brownfield sites***

BROWNFIELDS..... Brownfields Sites Listing

### **ADDITIONAL ENVIRONMENTAL RECORDS**

#### ***Local Brownfield lists***

US BROWNFIELDS..... A Listing of Brownfields Sites

#### ***Local Lists of Landfill / Solid Waste Disposal Sites***

SWRCY..... Registered Recyclers Listing

HIST LF..... Historical Landfill List



## EXECUTIVE SUMMARY

INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands  
 DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations  
 ODI..... Open Dump Inventory  
 IHS OPEN DUMPS..... Open Dumps on Indian Land  
 DENVER CO HISTORIC FILL Denver City & County Historic Fill Areas

### **Local Lists of Hazardous waste / Contaminated Sites**

US HIST CDL..... Delisted National Clandestine Laboratory Register  
 CDL..... Meth Lab Locations  
 US CDL..... National Clandestine Laboratory Register

### **Local Land Records**

LIENS 2..... CERCLA Lien Information

### **Records of Emergency Release Reports**

HMIRS..... Hazardous Materials Information Reporting System  
 SPILLS..... Spills Database  
 SPILLS 90..... SPILLS 90 data from FirstSearch

### **Other Ascertainable Records**

FUDS..... Formerly Used Defense Sites  
 DOD..... Department of Defense Sites  
 SCRD DRYCLEANERS..... State Coalition for Remediation of Drycleaners Listing  
 US FIN ASSUR..... Financial Assurance Information  
 EPA WATCH LIST..... EPA WATCH LIST  
 2020 COR ACTION..... 2020 Corrective Action Program List  
 TSCA..... Toxic Substances Control Act  
 TRIS..... Toxic Chemical Release Inventory System  
 SSTS..... Section 7 Tracking Systems  
 ROD..... Records Of Decision  
 RMP..... Risk Management Plans  
 RAATS..... RCRA Administrative Action Tracking System  
 PRP..... Potentially Responsible Parties  
 PADS..... PCB Activity Database System  
 ICIS..... Integrated Compliance Information System  
 FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)  
 MLTS..... Material Licensing Tracking System  
 COAL ASH DOE..... Steam-Electric Plant Operation Data  
 COAL ASH EPA..... Coal Combustion Residues Surface Impoundments List  
 PCB TRANSFORMER..... PCB Transformer Registration Database  
 RADINFO..... Radiation Information Database  
 HIST FTTS..... FIFRA/TSCA Tracking System Administrative Case Listing  
 DOT OPS..... Incident and Accident Data  
 CONSENT..... Superfund (CERCLA) Consent Decrees  
 INDIAN RESERV..... Indian Reservations  
 FUSRAP..... Formerly Utilized Sites Remedial Action Program  
 UMTRA..... Uranium Mill Tailings Sites  
 LEAD SMELTERS..... Lead Smelter Sites  
 US AIRS..... Aerometric Information Retrieval System Facility Subsystem  
 US MINES..... Mines Master Index File

## EXECUTIVE SUMMARY

|                              |                                                            |
|------------------------------|------------------------------------------------------------|
| ABANDONED MINES.....         | Abandoned Mines                                            |
| MINES MRDS.....              | Mineral Resources Data System                              |
| DOCKET HWC.....              | Hazardous Waste Compliance Docket Listing                  |
| UXO.....                     | Unexploded Ordnance Sites                                  |
| FUELS PROGRAM.....           | EPA Fuels Program Registered Listing                       |
| PFAS NPL.....                | Superfund Sites with PFAS Detections Information           |
| PFAS FEDERAL SITES.....      | Federal Sites PFAS Information                             |
| PFAS TSCA.....               | PFAS Manufacture and Imports Information                   |
| PFAS TRIS.....               | List of PFAS Added to the TRI                              |
| PFAS RCRA MANIFEST.....      | PFAS Transfers Identified In the RCRA Database Listing     |
| PFAS ATSDR.....              | PFAS Contamination Site Location Listing                   |
| PFAS WQP.....                | Ambient Environmental Sampling for PFAS                    |
| PFAS NPDES.....              | Clean Water Act Discharge Monitoring Information           |
| PFAS ECHO.....               | Facilities in Industries that May Be Handling PFAS Listing |
| PFAS ECHO FIRE TRAINING..... | Facilities in Industries that May Be Handling PFAS Listing |
| PFAS PART 139 AIRPORT.....   | All Certified Part 139 Airports PFAS Information Listing   |
| AQUEOUS FOAM NRC.....        | Aqueous Foam Related Incidents Listing                     |
| BIOSOLIDS.....               | ICIS-NPDES Biosolids Facility Data                         |
| PFAS.....                    | PFAS Information Listing                                   |
| AQUEOUS FOAM.....            | Class B Firefighting Foam Contaminating PFAS Listing       |
| AIRS.....                    | Permitted Facility & Emissions Listing                     |
| ASBESTOS.....                | Asbestos Abatement & Demolition Projects                   |
| METHANE SITE.....            | Methane Site Investigations - Jefferson County 1980        |
| Methane Investigation.....   | Methane Gas & Swamp Findings                               |
| DRYCLEANERS.....             | Drycleaner Facilities                                      |
| Financial Assurance.....     | Financial Assurance Information Listing                    |
| LEAD.....                    | LEAD                                                       |
| MINES.....                   | Permitted Mines Listing                                    |
| UIC.....                     | Underground Injection Control                              |
| UMTRA.....                   | Uranium Mill Tailings Sites                                |

### EDR HIGH RISK HISTORICAL RECORDS

#### ***EDR Exclusive Records***

|                       |                                         |
|-----------------------|-----------------------------------------|
| EDR MGP.....          | EDR Proprietary Manufactured Gas Plants |
| EDR Hist Auto.....    | EDR Exclusive Historical Auto Stations  |
| EDR Hist Cleaner..... | EDR Exclusive Historical Cleaners       |

### EDR RECOVERED GOVERNMENT ARCHIVES

#### ***Exclusive Recovered Govt. Archives***

|               |                                                               |
|---------------|---------------------------------------------------------------|
| RGA LF.....   | Recovered Government Archive Solid Waste Facilities List      |
| RGA LUST..... | Recovered Government Archive Leaking Underground Storage Tank |

### SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property. Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

## EXECUTIVE SUMMARY

### STANDARD ENVIRONMENTAL RECORDS

#### *Lists of Federal RCRA facilities undergoing Corrective Action*

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 12/04/2023 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

| <u>Lower Elevation</u>                               | <u>Address</u>            | <u>Direction / Distance</u>     | <u>Map ID</u> | <u>Page</u> |
|------------------------------------------------------|---------------------------|---------------------------------|---------------|-------------|
| <b>EIMCO COAL MACHINERY</b><br>EPA ID:: COD981544786 | <b>2222 DEVERUEX ROAD</b> | <b>NW 1/8 - 1/4 (0.190 mi.)</b> | <b>5</b>      | <b>18</b>   |

#### *Lists of Federal RCRA generators*

RCRA-VSQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-VSQG list, as provided by EDR, and dated 12/04/2023 has revealed that there are 2 RCRA-VSQG sites within approximately 0.25 miles of the target property.

| <u>Lower Elevation</u>                               | <u>Address</u>             | <u>Direction / Distance</u>      | <u>Map ID</u> | <u>Page</u> |
|------------------------------------------------------|----------------------------|----------------------------------|---------------|-------------|
| <b>ROARING FORK TRANSPO</b><br>EPA ID:: COR000219642 | <b>2307 WULFSOHN RD</b>    | <b>0 - 1/8 (0.001 mi.)</b>       | <b>B4</b>     | <b>14</b>   |
| <b>SALLY BEAUTY SUPPLY</b><br>EPA ID:: COR000253120  | <b>20 MARKET ST UNIT C</b> | <b>NNE 1/8 - 1/4 (0.207 mi.)</b> | <b>9</b>      | <b>48</b>   |

#### *Lists of state and tribal landfills and solid waste disposal facilities*

SHWF: A listing from the Solid Waste Information System, which is used to help administer the various programs of our solid waste and materials management program. It includes a wide variety of types of facilities and sites, and includes information obtained over several decades and numerous legacy data systems.

A review of the SHWF list, as provided by EDR, and dated 01/29/2024 has revealed that there are 2 SHWF sites within approximately 0.5 miles of the target property.

| <u>Lower Elevation</u>      | <u>Address</u>     | <u>Direction / Distance</u>      | <u>Map ID</u> | <u>Page</u> |
|-----------------------------|--------------------|----------------------------------|---------------|-------------|
| <b>DISCOUNT TIRE</b>        | <b>51537 HWY 6</b> | <b>N 1/8 - 1/4 (0.201 mi.)</b>   | <b>C6</b>     | <b>46</b>   |
| <b>MCD AUTOMOTIVE INTER</b> | <b>51429 HWY 6</b> | <b>NNW 1/8 - 1/4 (0.230 mi.)</b> | <b>12</b>     | <b>53</b>   |

## EXECUTIVE SUMMARY

### ***Lists of state and tribal leaking storage tanks***

LTANKS: Active and Closed OPS Petroleum Release Events in Colorado. Includes the OPS Open Event locations, but also shows locations of closed events (releases that have been issued a No Further Action determination).

A review of the LTANKS list, as provided by EDR, and dated 02/01/2024 has revealed that there are 5 LTANKS sites within approximately 0.5 miles of the target property.

| <u>Lower Elevation</u>      | <u>Address</u>              | <u>Direction / Distance</u>     | <u>Map ID</u> | <u>Page</u> |
|-----------------------------|-----------------------------|---------------------------------|---------------|-------------|
| <b>RFTA - ROARING FORK</b>  | <b>2307 WULFSOHN RD</b>     | <b>0 - 1/8 (0.001 mi.)</b>      | <b>B3</b>     | <b>10</b>   |
| EZ WAY RENTALS INC          | 51527 US HWY 6              | N 1/8 - 1/4 (0.216 mi.)         | D11           | 52          |
| <b>ALTA CONVENIENCE #63</b> | <b>51171 HWY 6 &amp; 24</b> | <b>NW 1/4 - 1/2 (0.387 mi.)</b> | <b>E15</b>    | <b>56</b>   |
| <b>23 MEL REY</b>           | <b>23 MEL REY RD</b>        | <b>NW 1/4 - 1/2 (0.421 mi.)</b> | <b>E18</b>    | <b>78</b>   |
| <b>WEST CARWASH</b>         | <b>77 MEL REY RD</b>        | <b>NW 1/4 - 1/2 (0.456 mi.)</b> | <b>F20</b>    | <b>83</b>   |

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Health's Leaking Underground Storage Tank List.

A review of the LUST list, as provided by EDR, and dated 03/01/2018 has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

| <u>Lower Elevation</u>               | <u>Address</u>              | <u>Direction / Distance</u>     | <u>Map ID</u> | <u>Page</u> |
|--------------------------------------|-----------------------------|---------------------------------|---------------|-------------|
| <b>RFTA - ROARING FORK</b>           | <b>2307 WULFSOHN RD</b>     | <b>0 - 1/8 (0.001 mi.)</b>      | <b>B3</b>     | <b>10</b>   |
| Facility Id: 15558<br>Status: Closed |                             |                                 |               |             |
| <b>ALTA CONVENIENCE #63</b>          | <b>51171 HWY 6 &amp; 24</b> | <b>NW 1/4 - 1/2 (0.387 mi.)</b> | <b>E15</b>    | <b>56</b>   |
| Facility Id: 9009<br>Status: Closed  |                             |                                 |               |             |
| <b>23 MEL REY</b>                    | <b>23 MEL REY RD</b>        | <b>NW 1/4 - 1/2 (0.421 mi.)</b> | <b>E17</b>    | <b>66</b>   |
| Facility Id: 1655<br>Status: Closed  |                             |                                 |               |             |
| <b>WEST CARWASH</b>                  | <b>77 MEL REY RD</b>        | <b>NW 1/4 - 1/2 (0.456 mi.)</b> | <b>F20</b>    | <b>83</b>   |
| Facility Id: 10965<br>Status: Closed |                             |                                 |               |             |

LUST TRUST: Reimbursement application package. The 1989 Colorado General Assembly established Colorado's Petroleum Storage Tank Fund. The Fund reimburses eligible applicants for allowable costs incurred in cleaning up petroleum contamination from underground and aboveground petroleum storage tanks, as well as for third-party liability expenses. Remediation of contamination caused by railroad or aircraft fuel is not eligible for reimbursement. The Fund satisfies federal Environmental Protection Agency financial assurance requirements. Monies in the Fund come from various sources, predominantly the state environmental surcharge imposed on all petroleum products except railroad or aircraft fuel.

A review of the LUST TRUST list, as provided by EDR, and dated 12/12/2023 has revealed that there is 1 LUST TRUST site within approximately 0.5 miles of the target property.

| <u>Lower Elevation</u> | <u>Address</u>       | <u>Direction / Distance</u>     | <u>Map ID</u> | <u>Page</u> |
|------------------------|----------------------|---------------------------------|---------------|-------------|
| <b>23 MEL REY</b>      | <b>23 MEL REY RD</b> | <b>NW 1/4 - 1/2 (0.421 mi.)</b> | <b>E17</b>    | <b>66</b>   |

## EXECUTIVE SUMMARY

Facility Id: 1655

### ***Lists of state and tribal registered storage tanks***

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The source is the State Oil Inspector's Office's Tank List.

A review of the UST list, as provided by EDR, and dated 05/23/2024 has revealed that there are 2 UST sites within approximately 0.25 miles of the target property.

| <u>Lower Elevation</u>                                                                                                                                                                                                | <u>Address</u>                 | <u>Direction / Distance</u>    | <u>Map ID</u> | <u>Page</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------|---------------|-------------|
| <b>RFTA - ROARING FORK</b><br>Facility Id: 15558<br>Tank Status: Currently In Use<br>Tank Tag/Tank Status: 15558-3<br>Tank Tag/Tank Status: 15558-4<br>Tank Tag/Tank Status: 15558-1<br>Tank Tag/Tank Status: 15558-2 | <b>2307 WULFSOHN RD</b>        | <b>0 - 1/8 (0.001 mi.)</b>     | <b>B3</b>     | <b>10</b>   |
| <b>E-Z WAY RENTALS INC</b><br>Facility Id: 7699<br>Tank Status: Permanently Closed<br>Tank Tag/Tank Status: 7699-1                                                                                                    | <b>51517 US HWY 6 &amp; 24</b> | <b>N 1/8 - 1/4 (0.213 mi.)</b> | <b>D10</b>    | <b>51</b>   |

AST: The Aboveground Storage Tank database contains registered ASTs. The source is the State Oil Inspector's Office's Tank List.

A review of the AST list, as provided by EDR, and dated 05/23/2024 has revealed that there are 2 AST sites within approximately 0.25 miles of the target property.

| <u>Lower Elevation</u>                                                                | <u>Address</u>          | <u>Direction / Distance</u>    | <u>Map ID</u> | <u>Page</u> |
|---------------------------------------------------------------------------------------|-------------------------|--------------------------------|---------------|-------------|
| <b>RFTA - ROARING FORK</b><br>Tank Status: Pending Installation<br>Facility Id: 15558 | <b>2307 WULFSOHN RD</b> | <b>0 - 1/8 (0.001 mi.)</b>     | <b>B3</b>     | <b>10</b>   |
| <b>GLENWOOD SPRINGS CHR</b><br>Tank Status: Permanently Closed<br>Facility Id: 16643  | <b>51537 HWY 6</b>      | <b>N 1/8 - 1/4 (0.201 mi.)</b> | <b>C7</b>     | <b>47</b>   |

### **ADDITIONAL ENVIRONMENTAL RECORDS**

#### ***Other Ascertainable Records***

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or

## EXECUTIVE SUMMARY

dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/04/2023 has revealed that there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the target property.

| <u>Lower Elevation</u>                               | <u>Address</u>            | <u>Direction / Distance</u>     | <u>Map ID</u> | <u>Page</u> |
|------------------------------------------------------|---------------------------|---------------------------------|---------------|-------------|
| <b>EIMCO COAL MACHINERY</b><br>EPA ID:: COD981544786 | <b>2222 DEVERUEX ROAD</b> | <b>NW 1/8 - 1/4 (0.190 mi.)</b> | <b>5</b>      | <b>18</b>   |

UST FINDER: EPA developed UST Finder, a web map application containing a comprehensive, state-sourced national map of underground storage tank (UST) and leaking UST (LUST) data. It provides the attributes and locations of active and closed USTs, UST facilities, and LUST sites from states and from Tribal lands and US territories. UST Finder contains information about proximity of UST facilities and LUST sites to: surface and groundwater public drinking water protection areas; estimated number of private domestic wells and number of people living nearby; and flooding and wildfires.

A review of the UST FINDER list, as provided by EDR, and dated 06/08/2023 has revealed that there are 2 UST FINDER sites within approximately 0.25 miles of the target property.

| <u>Lower Elevation</u>     | <u>Address</u>                 | <u>Direction / Distance</u>    | <u>Map ID</u> | <u>Page</u> |
|----------------------------|--------------------------------|--------------------------------|---------------|-------------|
| <b>E-Z WAY RENTALS INC</b> | <b>51517 US HWY 6 &amp; 24</b> | <b>N 1/8 - 1/4 (0.203 mi.)</b> | <b>C8</b>     | <b>47</b>   |
| <b>REY MOTORS INC</b>      | <b>51457 HWY 6 &amp; 24</b>    | <b>N 1/8 - 1/4 (0.242 mi.)</b> | <b>D13</b>    | <b>53</b>   |

UST FINDER RELEASE: US EPA's UST Finder data is a national composite of leaking underground storage tanks. This data contains information about, and locations of, leaking underground storage tanks. Data was collected from state sources and standardized into a national profile by EPA's Office of Underground Storage Tanks, Office of Research and Development, and the Association of State and Territorial Solid Waste Management Officials.

A review of the UST FINDER RELEASE list, as provided by EDR, and dated 06/08/2023 has revealed that there are 4 UST FINDER RELEASE sites within approximately 0.5 miles of the target property.

| <u>Lower Elevation</u>      | <u>Address</u>              | <u>Direction / Distance</u>     | <u>Map ID</u> | <u>Page</u> |
|-----------------------------|-----------------------------|---------------------------------|---------------|-------------|
| <b>REY MOTORS INC</b>       | <b>51457 HWY 6 &amp; 24</b> | <b>N 1/8 - 1/4 (0.242 mi.)</b>  | <b>D13</b>    | <b>53</b>   |
| <b>7-ELEVEN #17211</b>      | <b>51315 HWY 6</b>          | <b>NW 1/4 - 1/2 (0.274 mi.)</b> | <b>14</b>     | <b>55</b>   |
| <b>ALTA CONVENIENCE #60</b> | <b>23 MEL REY RD</b>        | <b>NW 1/4 - 1/2 (0.421 mi.)</b> | <b>E16</b>    | <b>64</b>   |
| <b>WEST CARWASH</b>         | <b>77 MEL REY RD</b>        | <b>NW 1/4 - 1/2 (0.456 mi.)</b> | <b>F19</b>    | <b>81</b>   |

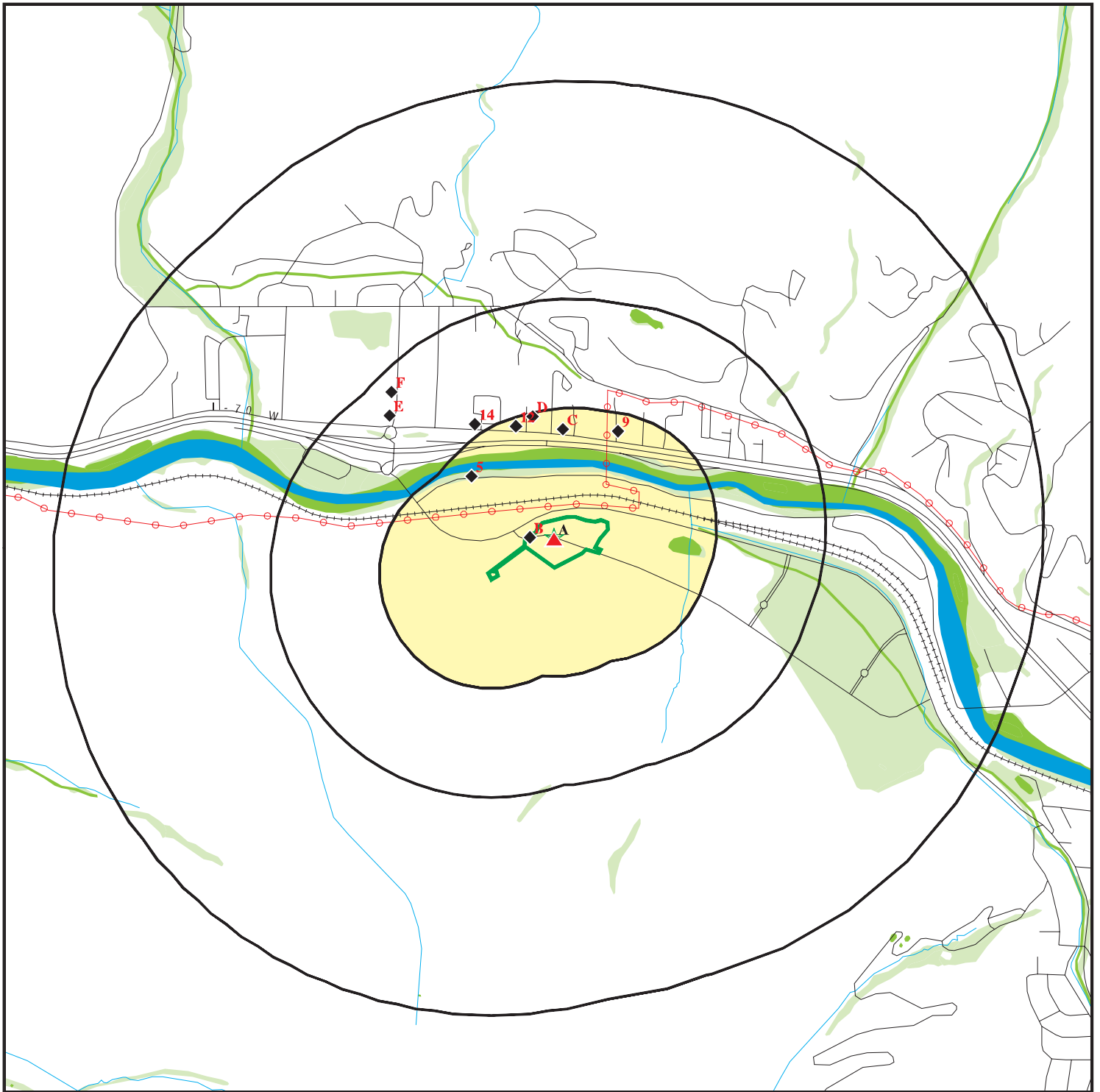


## EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 3 records.

| <u>Site Name</u>                   | <u>Database(s)</u> |
|------------------------------------|--------------------|
| GLENWOOD SPRINGS SECTION HQ        | LTANKS, UST        |
| GLENWOOD MUNICIPAL OPERATIONS CENT | LTANKS             |
| GLENWOOD MUNICIPAL OPERATIONS CENT | AST                |

# OVERVIEW MAP - 07666145.2R



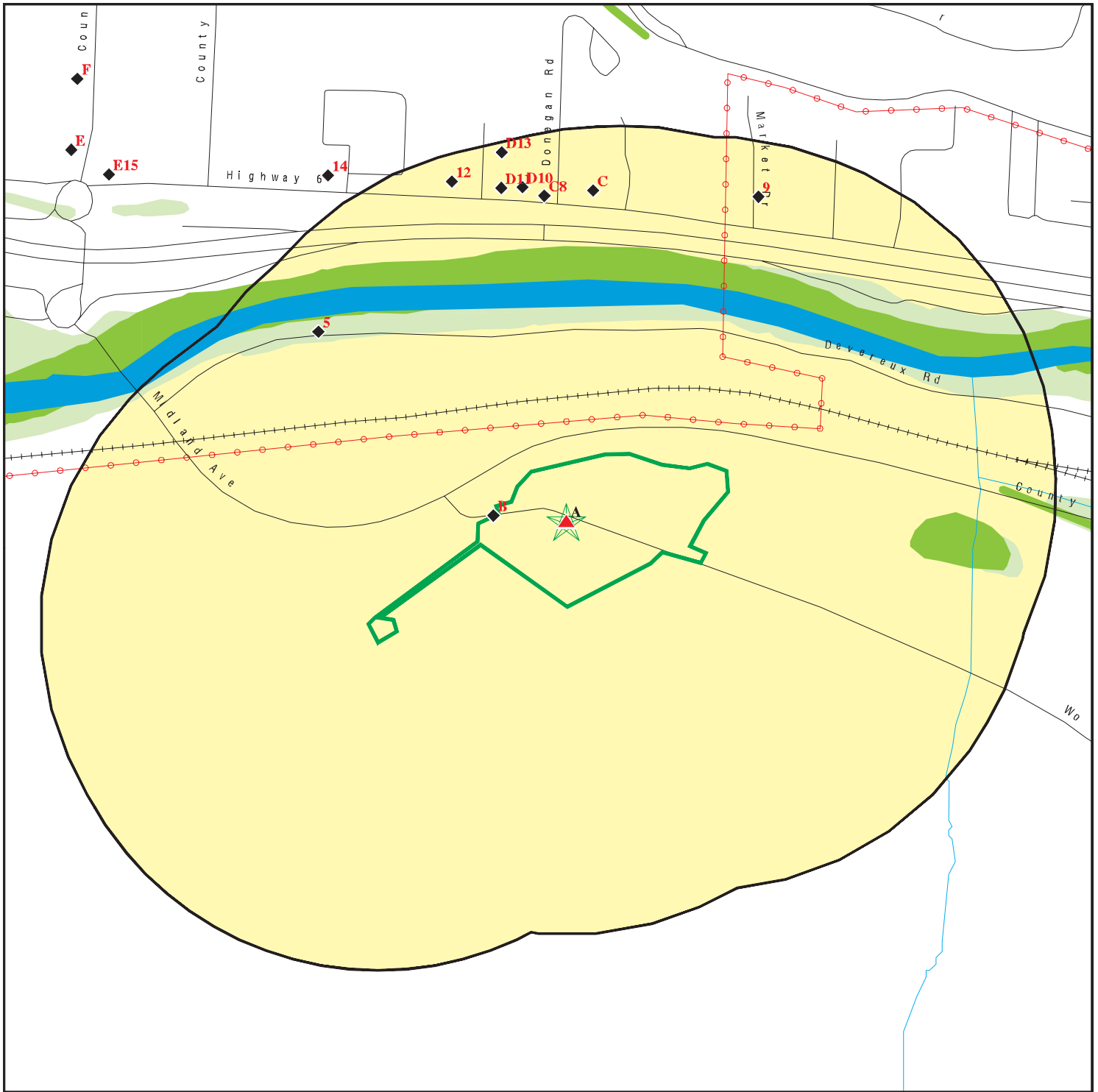
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Glenwood Springs Municipal Operations Center  
 ADDRESS: 2302 Wulfsohn Rd  
 Glenwood Springs CO 81601  
 LAT/LONG: 39.557838 / 107.354464

CLIENT: ERO Resources  
 CONTACT: Jacob King  
 INQUIRY #: 07666145.2r  
 DATE: May 30, 2024 11:06 am

# DETAIL MAP - 07666145.2R



-  Target Property
-  Sites at elevations higher than or equal to the target property
-  Sites at elevations lower than the target property
-  Manufactured Gas Plants
-  Sensitive Receptors
-  National Priority List Sites
-  Dept. Defense Sites

-  Indian Reservations BIA
-  Power transmission lines
-  National Wetland Inventory
-  State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Glenwood Springs Municipal Operations Center  
 ADDRESS: 2302 Wulfsohn Rd  
 Glenwood Springs CO 81601  
 LAT/LONG: 39.557838 / 107.354464

CLIENT: ERO Resources  
 CONTACT: Jacob King  
 INQUIRY #: 07666145.2r  
 DATE: May 30, 2024 11:06 am

## MAP FINDINGS SUMMARY

| Database                                                                              | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---------------------------------------------------------------------------------------|-------------------------|-----------------|-------|-----------|-----------|---------|-----|---------------|
| <b>STANDARD ENVIRONMENTAL RECORDS</b>                                                 |                         |                 |       |           |           |         |     |               |
| <b><i>Lists of Federal NPL (Superfund) sites</i></b>                                  |                         |                 |       |           |           |         |     |               |
| NPL                                                                                   | 1.000                   |                 | 0     | 0         | 0         | 0       | NR  | 0             |
| Proposed NPL                                                                          | 1.000                   |                 | 0     | 0         | 0         | 0       | NR  | 0             |
| NPL LIENS                                                                             | 1.000                   |                 | 0     | 0         | 0         | 0       | NR  | 0             |
| <b><i>Lists of Federal Delisted NPL sites</i></b>                                     |                         |                 |       |           |           |         |     |               |
| Delisted NPL                                                                          | 1.000                   |                 | 0     | 0         | 0         | 0       | NR  | 0             |
| <b><i>Lists of Federal sites subject to CERCLA removals and CERCLA orders</i></b>     |                         |                 |       |           |           |         |     |               |
| FEDERAL FACILITY                                                                      | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| SEMS                                                                                  | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Lists of Federal CERCLA sites with NFRAP</i></b>                                |                         |                 |       |           |           |         |     |               |
| SEMS-ARCHIVE                                                                          | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Lists of Federal RCRA facilities undergoing Corrective Action</i></b>           |                         |                 |       |           |           |         |     |               |
| CORRACTS                                                                              | 1.000                   |                 | 0     | 1         | 0         | 0       | NR  | 1             |
| <b><i>Lists of Federal RCRA TSD facilities</i></b>                                    |                         |                 |       |           |           |         |     |               |
| RCRA-TSDF                                                                             | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Lists of Federal RCRA generators</i></b>                                        |                         |                 |       |           |           |         |     |               |
| RCRA-LQG                                                                              | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| RCRA-SQG                                                                              | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| RCRA-VSQG                                                                             | 0.250                   |                 | 1     | 1         | NR        | NR      | NR  | 2             |
| <b><i>Federal institutional controls / engineering controls registries</i></b>        |                         |                 |       |           |           |         |     |               |
| LUCIS                                                                                 | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| US ENG CONTROLS                                                                       | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| US INST CONTROLS                                                                      | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Federal ERNS list</i></b>                                                       |                         |                 |       |           |           |         |     |               |
| ERNS                                                                                  | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| <b><i>Lists of state- and tribal hazardous waste facilities</i></b>                   |                         |                 |       |           |           |         |     |               |
| SHWS                                                                                  | N/A                     |                 | N/A   | N/A       | N/A       | N/A     | N/A | N/A           |
| <b><i>Lists of state and tribal landfills and solid waste disposal facilities</i></b> |                         |                 |       |           |           |         |     |               |
| SWF/LF                                                                                | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| SHWF                                                                                  | 0.500                   |                 | 0     | 2         | 0         | NR      | NR  | 2             |
| <b><i>Lists of state and tribal leaking storage tanks</i></b>                         |                         |                 |       |           |           |         |     |               |
| LTANKS                                                                                | 0.500                   |                 | 1     | 1         | 3         | NR      | NR  | 5             |

## MAP FINDINGS SUMMARY

| Database                                                                              | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---------------------------------------------------------------------------------------|-------------------------|-----------------|-------|-----------|-----------|---------|-----|---------------|
| LUST                                                                                  | 0.500                   |                 | 1     | 0         | 3         | NR      | NR  | 4             |
| LAST                                                                                  | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| INDIAN LUST                                                                           | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| LUST TRUST                                                                            | 0.500                   |                 | 0     | 0         | 1         | NR      | NR  | 1             |
| <b><i>Lists of state and tribal registered storage tanks</i></b>                      |                         |                 |       |           |           |         |     |               |
| FEMA UST                                                                              | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| UST                                                                                   | 0.250                   |                 | 1     | 1         | NR        | NR      | NR  | 2             |
| AST                                                                                   | 0.250                   |                 | 1     | 1         | NR        | NR      | NR  | 2             |
| INDIAN UST                                                                            | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| <b><i>State and tribal institutional control / engineering control registries</i></b> |                         |                 |       |           |           |         |     |               |
| AUL                                                                                   | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Lists of state and tribal voluntary cleanup sites</i></b>                       |                         |                 |       |           |           |         |     |               |
| VCP                                                                                   | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| INDIAN VCP                                                                            | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Lists of state and tribal brownfield sites</i></b>                              |                         |                 |       |           |           |         |     |               |
| BROWNFIELDS                                                                           | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><u>ADDITIONAL ENVIRONMENTAL RECORDS</u></b>                                        |                         |                 |       |           |           |         |     |               |
| <b><i>Local Brownfield lists</i></b>                                                  |                         |                 |       |           |           |         |     |               |
| US BROWNFIELDS                                                                        | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Local Lists of Landfill / Solid Waste Disposal Sites</i></b>                    |                         |                 |       |           |           |         |     |               |
| SWRCY                                                                                 | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| HIST LF                                                                               | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| INDIAN ODI                                                                            | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| DEBRIS REGION 9                                                                       | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| ODI                                                                                   | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| IHS OPEN DUMPS                                                                        | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| DENVER CO HISTORIC FILL                                                               | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| <b><i>Local Lists of Hazardous waste / Contaminated Sites</i></b>                     |                         |                 |       |           |           |         |     |               |
| US HIST CDL                                                                           | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| CDL                                                                                   | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| US CDL                                                                                | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| <b><i>Local Land Records</i></b>                                                      |                         |                 |       |           |           |         |     |               |
| LIENS 2                                                                               | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| <b><i>Records of Emergency Release Reports</i></b>                                    |                         |                 |       |           |           |         |     |               |
| HMIRS                                                                                 | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| SPILLS                                                                                | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| SPILLS 90                                                                             | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |

## MAP FINDINGS SUMMARY

| Database                           | Search<br>Distance<br>(Miles) | Target<br>Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total<br>Plotted |
|------------------------------------|-------------------------------|--------------------|-------|-----------|-----------|---------|-----|------------------|
| <b>Other Ascertainable Records</b> |                               |                    |       |           |           |         |     |                  |
| RCRA NonGen / NLR                  | 0.250                         |                    | 0     | 1         | NR        | NR      | NR  | 1                |
| FUDS                               | 1.000                         |                    | 0     | 0         | 0         | 0       | NR  | 0                |
| DOD                                | 1.000                         |                    | 0     | 0         | 0         | 0       | NR  | 0                |
| SCRD DRYCLEANERS                   | 0.500                         |                    | 0     | 0         | 0         | NR      | NR  | 0                |
| US FIN ASSUR                       | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| EPA WATCH LIST                     | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| 2020 COR ACTION                    | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| TSCA                               | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| TRIS                               | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| SSTS                               | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| ROD                                | 1.000                         |                    | 0     | 0         | 0         | 0       | NR  | 0                |
| RMP                                | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| RAATS                              | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| PRP                                | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| PADS                               | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| ICIS                               | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| FTTS                               | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| MLTS                               | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| COAL ASH DOE                       | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| COAL ASH EPA                       | 0.500                         |                    | 0     | 0         | 0         | NR      | NR  | 0                |
| PCB TRANSFORMER                    | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| RADINFO                            | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| HIST FTTS                          | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| DOT OPS                            | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| CONSENT                            | 1.000                         |                    | 0     | 0         | 0         | 0       | NR  | 0                |
| INDIAN RESERV                      | 1.000                         |                    | 0     | 0         | 0         | 0       | NR  | 0                |
| FUSRAP                             | 1.000                         |                    | 0     | 0         | 0         | 0       | NR  | 0                |
| UMTRA                              | 0.500                         |                    | 0     | 0         | 0         | NR      | NR  | 0                |
| LEAD SMELTERS                      | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| US AIRS                            | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| US MINES                           | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| ABANDONED MINES                    | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| MINES MRDS                         | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| FINDS                              | TP                            | 1                  | NR    | NR        | NR        | NR      | NR  | 1                |
| ECHO                               | TP                            | 1                  | NR    | NR        | NR        | NR      | NR  | 1                |
| DOCKET HWC                         | TP                            |                    | NR    | NR        | NR        | NR      | NR  | 0                |
| UXO                                | 1.000                         |                    | 0     | 0         | 0         | 0       | NR  | 0                |
| FUELS PROGRAM                      | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS NPL                           | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS FEDERAL SITES                 | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS TSCA                          | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS TRIS                          | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS RCRA MANIFEST                 | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS ATSDR                         | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS WQP                           | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS NPDES                         | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS ECHO                          | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS ECHO FIRE TRAINING            | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |
| PFAS PART 139 AIRPORT              | 0.250                         |                    | 0     | 0         | NR        | NR      | NR  | 0                |



## MAP FINDINGS SUMMARY

| Database              | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|-----------------------|-------------------------|-----------------|-------|-----------|-----------|---------|-----|---------------|
| AQUEOUS FOAM NRC      | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| BIOSOLIDS             | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| PFAS                  | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| AQUEOUS FOAM          | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| AIRS                  | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| ASBESTOS              | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| METHANE SITE          | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| Methane Investigation | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| DRYCLEANERS           | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| Financial Assurance   | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| LEAD                  | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| MINES                 | 0.250                   |                 | 0     | 0         | NR        | NR      | NR  | 0             |
| NPDES                 | TP                      | 1               | NR    | NR        | NR        | NR      | NR  | 1             |
| UIC                   | TP                      |                 | NR    | NR        | NR        | NR      | NR  | 0             |
| UMTRA                 | 0.500                   |                 | 0     | 0         | 0         | NR      | NR  | 0             |
| UST FINDER            | 0.250                   |                 | 0     | 2         | NR        | NR      | NR  | 2             |
| UST FINDER RELEASE    | 0.500                   |                 | 0     | 1         | 3         | NR      | NR  | 4             |

### EDR HIGH RISK HISTORICAL RECORDS

#### ***EDR Exclusive Records***

|                  |       |  |   |    |    |    |    |   |
|------------------|-------|--|---|----|----|----|----|---|
| EDR MGP          | 1.000 |  | 0 | 0  | 0  | 0  | NR | 0 |
| EDR Hist Auto    | 0.125 |  | 0 | NR | NR | NR | NR | 0 |
| EDR Hist Cleaner | 0.125 |  | 0 | NR | NR | NR | NR | 0 |

### EDR RECOVERED GOVERNMENT ARCHIVES

#### ***Exclusive Recovered Govt. Archives***

|          |    |  |    |    |    |    |    |   |
|----------|----|--|----|----|----|----|----|---|
| RGA LF   | TP |  | NR | NR | NR | NR | NR | 0 |
| RGA LUST | TP |  | NR | NR | NR | NR | NR | 0 |

|             |  |   |   |    |    |   |   |    |
|-------------|--|---|---|----|----|---|---|----|
| - Totals -- |  | 3 | 5 | 11 | 10 | 0 | 0 | 29 |
|-------------|--|---|---|----|----|---|---|----|

#### NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**A1**  
**Target**  
**Property**      **WEST GLENWOOD SPRINGS PARK AND RIDE**  
                  **2302 AND 2307 WULFSOHN RD**  
                  **GLENWOOD SPRINGS, CO 81601**

**FINDS**    **1018372482**  
**ECHO**      **N/A**

**Site 1 of 2 in cluster A**

**Actual:**  
**5793 ft.**

**FINDS:**  
Registry ID:                    110067620756

[Click Here for FRS Facility Detail Report:](#)

**Environmental Interest/Information System:**

The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

[Click this hyperlink](#) while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

**ECHO:**  
Envid:                            1018372482  
Registry ID:                    110067620756  
DFR URL:                        <http://echo.epa.gov/detailed-facility-report?fid=110067620756>  
Name:                            WEST GLENWOOD SPRINGS PARK AND RIDE  
Address:                        2302 AND 2307 WULFSOHN RD  
City,State,Zip:                GLENWOOD SPRINGS, CO 81601

**A2**  
**Target**  
**Property**      **WEST GLENWOOD SPRINGS PARK AND RIDE**  
                  **2302 AND 2307 WULFSOHN RD**  
                  **GLENWOOD SPRINGS, CO 81601**

**NPDES**    **S118558053**  
                  **N/A**

**Site 2 of 2 in cluster A**

**Actual:**  
**5793 ft.**

**NPDES:**  
Name:                            WEST GLENWOOD SPRINGS PARK AND RIDE  
Address:                        2302 And 2307 Wulfsohn Rd  
City,State,Zip:                GLENWOOD SPRINGS, CO 81601  
Primary Permit SIC Code:    4111  
Permit Number:                COR404041  
Permit Name:                    Roaring Fork Transportation Authority  
Termination Date:            Not reported  
Receiving Water:              Colorado River  
Issued:                          04/01/2019  
Effective:                        04/01/2019  
Expires:                         2024-03-31 00:00:00  
Permit Type Desc:             COR400000-Stormwater discharge associated with construction activities  
Contact Name:                 Bair  
Contact Office Phone Num:    9703797510  
Facility Type Desc:            Not reported  
Latitude:                        39.557043  
Longitude:                      -107.355922  
Immediate Water:              Not reported  
SW Construction Activity:    Highway  
Permit SIC1:                    1629  
Legal First Name:              Kelley  
Legal Last Name:               Collier  
Legal Title:                      COO

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST GLENWOOD SPRINGS PARK AND RIDE (Continued)**

**S118558053**

Facility Contact Title: PM  
Stream Segment: COLCLC04a  
SW Construction Total Acres: 7.51  
SW Construction Disturbed Acres: 5.2  
SW Construction Start Date: 2016-04-01 00:00:00  
SW Construction End Date: 2016-10-31 00:00:00  
Reuse TREATER ID: Not reported  
Reuse TREATER: Not reported  
Facility Description: Not reported  
Facility Contact Organization: Not reported  
Billing Organization: Not reported  
Billing FName: Not reported  
Billing LName: Not reported  
Billing Title: Not reported  
DMR Organization: Not reported  
DMR FName: Not reported  
DMR LName: Not reported  
DMR Title: Not reported  
Permit Sector: Construction  
Permit Status: Effective  
Activity Description: Not reported  
Legal Address1: Not reported  
Legal City: Not reported  
Legal State: Not reported  
Legal Zip code: Not reported  
Legal Phone: 9703844885  
Legal Email: kcollier@rfta.com  
Property Owner Organization: Not reported  
Property Owner FName: Not reported  
Property Owner LName: Not reported  
Property Owner Title: Not reported  
Property Owner Address1: Not reported  
Property Owner City: Not reported  
Property Owner State: Not reported  
Property Owner Zipcode: Not reported  
Property Owner Phone: Not reported  
Property Owner Email: Not reported  
Facility Contact Address1: Not reported  
Facility Contact City: Not reported  
Facility Contact State: Not reported  
Facility Contact Zipcode: Not reported  
Facility Contact Email: jbair@rfta.com  
Billing Address1: Not reported  
Billing City: Not reported  
Billing State: Not reported  
Billing Zipcode: Not reported  
Billing Phone: Not reported  
Billing Email: Not reported  
DMR Address1: Not reported  
DMR City: Not reported  
DMR State: Not reported  
DMR Zipcode: Not reported  
DMR Phone: Not reported  
DMR Email: Not reported  
Regulation ID: Not reported  
Major River Basin: Not reported  
Permit SIC2: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST GLENWOOD SPRINGS PARK AND RIDE (Continued)**

**S118558053**

Permit SIC3: Not reported  
Permit SIC4: Not reported

**B3**

**RFTA - ROARING FORK TRANSIT AGENCY**  
**2307 WULFSOHN RD**  
**GLENWOOD SPRINGS, CO 81601**

**LUST**  
**LTANKS**  
**UST**  
**AST**

**U003916829**  
**N/A**

**< 1/8**  
**0.001 mi.**  
**3 ft.**

**Site 1 of 2 in cluster B**

**Relative:**  
**Lower**

**LUST:**

**Actual:**  
**5783 ft.**

Name: ROARING FORK TRANSIT AGENCY  
Address: 2307 WULFSOHN RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility Id: 15558  
**Status: Closed**  
Event ID: 10241  
Confirmed Release: 11/01/2006  
Contact Name: Technical Assistance Line  
Contact Phone: 303-318-8547  
Contact Email: Not reported  
Latitude Degrees: 39.555354  
Longitude Degrees: -107.346868

Facility Id: 15558  
**Status: Closed**  
Event ID: 10428  
Confirmed Release: 08/01/2007  
Contact Name: Technical Assistance Line  
Contact Phone: 303-318-8547  
Contact Email: Not reported  
Latitude Degrees: 39.555354  
Longitude Degrees: -107.346868

Click here for COSTIS:

**LTANKS:**

Facility ID: 15558  
Name: RFTA - ROARING FORK TRANSIT AGENCY  
Address: 2307 WULFSOHN RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Tier I  
Status: Closed  
Event ID: 17254  
Release Date: 11/01/2022  
Closed Date: 10/11/2023  
Contact: Hannah Williams  
Phone: (303) 318-8519  
Email: hannah.williams@state.co.us  
Release Source: Other  
Release Cause: Unknown  
Reimbursement Total: Not reported  
Release Number: REL-016242  
URL: https://socgov18.force.com/s/release/a183h000003TeBn

Facility ID: 15558  
Name: RFTA - ROARING FORK TRANSIT AGENCY  
Address: 2307 WULFSOHN RD

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**RFTA - ROARING FORK TRANSIT AGENCY (Continued)**

**U003916829**

City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Tier I  
Status: Closed  
Event ID: 13464  
Release Date: 08/06/2019  
Closed Date: 03/06/2020  
Contact: Hannah Williams  
Phone: (303) 318-8519  
Email: hannah.williams@state.co.us  
Release Source: Not reported  
Release Cause: Other  
Reimbursement Total: Not reported  
Release Number: REL-009866  
URL: <https://socgov18.force.com/s/release/a183h000003KXp6>

Facility ID: 15558  
Name: RFTA - ROARING FORK TRANSIT AGENCY  
Address: 2307 WULFSOHN RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Tier I  
Status: Closed  
Event ID: 10241  
Release Date: 11/01/2006  
Closed Date: 05/10/2007  
Contact: Bobby Sonnier  
Phone: (303) 318-8547  
Email: cdle\_ops\_public\_record\_center@state.co.us  
Release Source: Overfill - spill bucket  
Release Cause: Not reported  
Reimbursement Total: Not reported  
Release Number: REL-009981  
URL: <https://socgov18.force.com/s/release/a183h000003KXqx>

Facility ID: 15558  
Name: RFTA - ROARING FORK TRANSIT AGENCY  
Address: 2307 WULFSOHN RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Tier I  
Status: Closed  
Event ID: 10428  
Release Date: 08/01/2007  
Closed Date: 11/14/2007  
Contact: Tina Sandoval  
Phone: (303) 318-8547  
Email: cdle\_ops\_public\_record\_center@state.co.us  
Release Source: Overfill - spill bucket  
Release Cause: Not reported  
Reimbursement Total: Not reported  
Release Number: REL-009982  
URL: <https://socgov18.force.com/s/release/a183h000003KXqy>

**UST:**

Tank Tag: 15558-3  
Substance: RUL  
Name: RFTA - ROARING FORK TRANSIT AGENCY  
Address: 2307 WULFSOHN RD  
City,State,Zip: GLENWOOD SPRINGS 81601

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**RFTA - ROARING FORK TRANSIT AGENCY (Continued)**

**U003916829**

|                      |                                       |
|----------------------|---------------------------------------|
| Tank Tag:            | 15558-3                               |
| Substance:           | RUL                                   |
| Facility ID:         | 15558                                 |
| Owner Name:          | Roaring Fork Transportation Authority |
| Owner Address:       | 1340 Main St, Carbondale, CO 81623    |
| Owner City:          | Carbondale                            |
| Owner State:         | CO                                    |
| Owner Zip:           | 81623                                 |
| Facility Type:       | Non-Retail                            |
| Facility Category:   | Commercial/Industrial                 |
| Capacity:            | 3000                                  |
| Date Closed:         | Not reported                          |
| Tank Status:         | Currently In Use                      |
| Date Tank Installed: | 09/24/2001                            |
| Tank Type:           | UST                                   |
| Latitude:            | 39.555354                             |
| Longitude:           | -107.346868                           |
| Tank Material:       | FRP: Fiberglass Reinforced Plastic    |
| Tank Wall Type:      | Not reported                          |
| Piping Type:         | UG: Underground                       |
| Piping System:       | Not reported                          |
| Piping Material:     | FLEX: Flexible Plastic                |
| Piping Wall Type:    | Double-Walled                         |
| Overfill Prevention: | FV: Fill Tube Valve                   |
| Tank ID:             | a1J3h000001jozp                       |
| Account Name:        | ACCT-09329                            |
|                      |                                       |
| Tank Tag:            | 15558-4                               |
| Substance:           | USED OIL                              |
| Name:                | RFTA - ROARING FORK TRANSIT AGENCY    |
| Address:             | 2307 WULFSOHN RD                      |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                |
| Tank Tag:            | 15558-4                               |
| Substance:           | USED OIL                              |
| Facility ID:         | 15558                                 |
| Owner Name:          | Roaring Fork Transportation Authority |
| Owner Address:       | 1340 Main St, Carbondale, CO 81623    |
| Owner City:          | Carbondale                            |
| Owner State:         | CO                                    |
| Owner Zip:           | 81623                                 |
| Facility Type:       | Non-Retail                            |
| Facility Category:   | Commercial/Industrial                 |
| Capacity:            | 1000                                  |
| Date Closed:         | Not reported                          |
| Tank Status:         | Currently In Use                      |
| Date Tank Installed: | 09/24/2001                            |
| Tank Type:           | UST                                   |
| Latitude:            | 39.555354                             |
| Longitude:           | -107.346868                           |
| Tank Material:       | FRP: Fiberglass Reinforced Plastic    |
| Tank Wall Type:      | Not reported                          |
| Piping Type:         | UG: Underground                       |
| Piping System:       | Not reported                          |
| Piping Material:     | FLEX: Flexible Plastic                |
| Piping Wall Type:    | Double-Walled                         |
| Overfill Prevention: | Other                                 |
| Tank ID:             | a1J3h000001jozq                       |



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**RFTA - ROARING FORK TRANSIT AGENCY (Continued)**

**U003916829**

|                      |                                       |
|----------------------|---------------------------------------|
| Account Name:        | ACCT-09329                            |
| Tank Tag:            | 15558-1                               |
| Substance:           | DSL                                   |
| Name:                | RFTA - ROARING FORK TRANSIT AGENCY    |
| Address:             | 2307 WULFSOHN RD                      |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                |
| Tank Tag:            | 15558-1                               |
| Substance:           | DSL                                   |
| Facility ID:         | 15558                                 |
| Owner Name:          | Roaring Fork Transportation Authority |
| Owner Address:       | 1340 Main St, Carbondale, CO 81623    |
| Owner City:          | Carbondale                            |
| Owner State:         | CO                                    |
| Owner Zip:           | 81623                                 |
| Facility Type:       | Non-Retail                            |
| Facility Category:   | Commercial/Industrial                 |
| Capacity:            | 15000                                 |
| Date Closed:         | Not reported                          |
| Tank Status:         | Currently In Use                      |
| Date Tank Installed: | 09/24/2001                            |
| Tank Type:           | UST                                   |
| Latitude:            | 39.555354                             |
| Longitude:           | -107.346868                           |
| Tank Material:       | FRP: Fiberglass Reinforced Plastic    |
| Tank Wall Type:      | Not reported                          |
| Piping Type:         | UG: Underground                       |
| Piping System:       | Not reported                          |
| Piping Material:     | FLEX: Flexible Plastic                |
| Piping Wall Type:    | Double-Walled                         |
| Overfill Prevention: | FV: Fill Tube Valve                   |
| Tank ID:             | a1J3h000001jozn                       |
| Account Name:        | ACCT-09329                            |
| Tank Tag:            | 15558-2                               |
| Substance:           | RUL                                   |
| Name:                | RFTA - ROARING FORK TRANSIT AGENCY    |
| Address:             | 2307 WULFSOHN RD                      |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                |
| Tank Tag:            | 15558-2                               |
| Substance:           | RUL                                   |
| Facility ID:         | 15558                                 |
| Owner Name:          | Roaring Fork Transportation Authority |
| Owner Address:       | 1340 Main St, Carbondale, CO 81623    |
| Owner City:          | Carbondale                            |
| Owner State:         | CO                                    |
| Owner Zip:           | 81623                                 |
| Facility Type:       | Non-Retail                            |
| Facility Category:   | Commercial/Industrial                 |
| Capacity:            | 6000                                  |
| Date Closed:         | Not reported                          |
| Tank Status:         | Currently In Use                      |
| Date Tank Installed: | 09/24/2001                            |
| Tank Type:           | UST                                   |
| Latitude:            | 39.555354                             |
| Longitude:           | -107.346868                           |
| Tank Material:       | FRP: Fiberglass Reinforced Plastic    |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**RFTA - ROARING FORK TRANSIT AGENCY (Continued)**

**U003916829**

Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FLEX: Flexible Plastic  
Piping Wall Type: Double-Walled  
Overfill Prevention: FV: Fill Tube Valve  
Tank ID: a1J3h000001jozo  
Account Name: ACCT-09329

**AST:**

Name: RFTA - ROARING FORK TRANSIT AGENCY  
Address: 2307 WULFSOHN RD  
City,State,Zip: GLENWOOD SPRINGS 81601  
Substance: DSLDYE2  
Tank Tag: 15558-5  
Facility ID: 15558  
Owner Name: Not reported  
Owner Address: 1340 Main St, Carbondale, CO 81623  
Owner City: Carbondale  
Owner State: CO  
Owner Zip: 81623  
Facility Type: Non-Retail  
Facility Category: Commercial/Industrial  
Capacity: 2000  
Tank Status: Pending Installation  
Date Tank Installed: Not reported  
Date Closed: Not reported  
Tank Type: AST  
Latitude: 39.555354  
Longitude: -107.346868  
Tank Material: UL142/Equiv.  
Tank Wall Type: Double-Walled  
Piping Type: AG - Aboveground  
Piping System: Suction  
Piping Material: Not reported  
Piping Wall Type: Not reported  
Overfill Prevention: AL: External Aud/Vis Alarm  
Tank ID: a1JDo000003RSZU  
Account Name: ACCT-09329

**B4**

**ROARING FORK TRANSPORTATION AUTHORITY-GMF  
2307 WULFSOHN RD  
GLENWOOD SPRINGS, CO 81601**

**RCRA-VSQG  
FINDS  
ECHO**

**1011488294  
COR000219642**

**< 1/8  
0.001 mi.  
3 ft.**

**Site 2 of 2 in cluster B**

**Relative:  
Lower**

**RCRA Listings:**

**Actual:  
5783 ft.**

Date Form Received by Agency: 20180606  
Handler Name: Roaring Fork Transportation Authority-Gmf  
Handler Address: Wulfsohn Rd  
Handler City,State,Zip: GLENWOOD SPRINGS, CO 81601  
EPA ID: COR000219642  
Contact Name: MIKE HERMES  
Contact Address: MAIN ST  
Contact City,State,Zip: CARBONDALE, CO 81623  
Contact Telephone: 970-384-4860  
Contact Fax: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ROARING FORK TRANSPORTATION AUTHORITY-GMF (Continued)**

**1011488294**

|                                                               |                                               |
|---------------------------------------------------------------|-----------------------------------------------|
| Contact Email:                                                | Not reported                                  |
| Contact Title:                                                | DIRECTOR OF FACILITIES                        |
| EPA Region:                                                   | 08                                            |
| Land Type:                                                    | County                                        |
| Federal Waste Generator Description:                          | Conditionally Exempt Small Quantity Generator |
| Non-Notifier:                                                 | Not reported                                  |
| Biennial Report Cycle:                                        | Not reported                                  |
| Accessibility:                                                | Not reported                                  |
| Active Site Indicator:                                        | Handler Activities                            |
| State District Owner:                                         | Not reported                                  |
| State District:                                               | Not reported                                  |
| Mailing Address:                                              | MAIN ST                                       |
| Mailing City,State,Zip:                                       | CARBONDALE, CO 81623                          |
| Owner Name:                                                   | Dan Blankenship                               |
| Owner Type:                                                   | County                                        |
| Operator Name:                                                | Roaring Fork Trans Authority-Gmf              |
| Operator Type:                                                | County                                        |
| Short-Term Generator Activity:                                | No                                            |
| Importer Activity:                                            | No                                            |
| Mixed Waste Generator:                                        | No                                            |
| Transporter Activity:                                         | No                                            |
| Transfer Facility Activity:                                   | No                                            |
| Recycler Activity with Storage:                               | No                                            |
| Small Quantity On-Site Burner Exemption:                      | No                                            |
| Smelting Melting and Refining Furnace Exemption:              | No                                            |
| Underground Injection Control:                                | No                                            |
| Off-Site Waste Receipt:                                       | No                                            |
| Universal Waste Indicator:                                    | No                                            |
| Universal Waste Destination Facility:                         | No                                            |
| Federal Universal Waste:                                      | No                                            |
| Active Site State-Reg Handler:                                | ---                                           |
| Federal Facility Indicator:                                   | Not reported                                  |
| Hazardous Secondary Material Indicator:                       | NN                                            |
| Sub-Part K Indicator:                                         | Not reported                                  |
| 2018 GPRA Permit Baseline:                                    | Not on the Baseline                           |
| 2018 GPRA Renewals Baseline:                                  | Not on the Baseline                           |
| 202 GPRA Corrective Action Baseline:                          | No                                            |
| Subject to Corrective Action Universe:                        | No                                            |
| Non-TSDFs Where RCRA CA has Been Imposed Universe:            | No                                            |
| Corrective Action Priority Ranking:                           | No NCAPS ranking                              |
| Environmental Control Indicator:                              | No                                            |
| Institutional Control Indicator:                              | No                                            |
| Human Exposure Controls Indicator:                            | N/A                                           |
| Groundwater Controls Indicator:                               | N/A                                           |
| Significant Non-Complier Universe:                            | No                                            |
| Unaddressed Significant Non-Complier Universe:                | No                                            |
| Addressed Significant Non-Complier Universe:                  | No                                            |
| Significant Non-Complier With a Compliance Schedule Universe: | No                                            |
| Financial Assurance Required:                                 | Not reported                                  |
| Handler Date of Last Change:                                  | 20180607                                      |
| Recognized Trader-Importer:                                   | No                                            |
| Recognized Trader-Exporter:                                   | No                                            |
| Importer of Spent Lead Acid Batteries:                        | No                                            |
| Exporter of Spent Lead Acid Batteries:                        | No                                            |
| Recycler Activity Without Storage:                            | No                                            |
| Manifest Broker:                                              | No                                            |
| Sub-Part P Indicator:                                         | No                                            |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ROARING FORK TRANSPORTATION AUTHORITY-GMF (Continued)**

**1011488294**

**Hazardous Waste Summary:**

Waste Code: F005  
Waste Description: The Following Spent Nonhalogenated Solvents: Toluene, Methyl Ethyl Ketone, Carbon Disulfide, Isobutanol, Pyridine, Benzene, 2-Ethoxyethanol, And 2-Nitropropane; All Spent Solvent Mixtures/Blends Containing, Before Use, A Total Of Ten Percent Or More (By Volume) Of One Or More Of The Above Nonhalogenated Solvents Or Those Solvents Listed In F001, F002, Or F004; And Still Bottoms From The Recovery Of These Spent Solvents And Spent Solvent Mixtures.

**Handler - Owner Operator:**

Owner/Operator Indicator: Operator  
Owner/Operator Name: ROARING FORK TRANS AUTHORITY-GMF  
Legal Status: County  
Date Became Current: 20080722  
Date Ended Current: Not reported  
Owner/Operator Address: 2307 WULFSOHN RD  
Owner/Operator City,State,Zip: GLENWOOD SPGS, CO 81601  
Owner/Operator Telephone: 970-384-4880  
Owner/Operator Telephone Ext: Not reported  
Owner/Operator Fax: Not reported  
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner  
Owner/Operator Name: DAN BLANKENSHIP  
Legal Status: County  
Date Became Current: 20080722  
Date Ended Current: Not reported  
Owner/Operator Address: 2307 WULFSOHN RD  
Owner/Operator City,State,Zip: GLENWOOD SPGS, CO 81601  
Owner/Operator Telephone: 970-384-4981  
Owner/Operator Telephone Ext: Not reported  
Owner/Operator Fax: Not reported  
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner  
Owner/Operator Name: DAN BLANKENSHIP  
Legal Status: County  
Date Became Current: 20080722  
Date Ended Current: Not reported  
Owner/Operator Address: 2307 WULFSOHN RD  
Owner/Operator City,State,Zip: GLENWOOD SPGS, CO 81601  
Owner/Operator Telephone: 970-384-4981  
Owner/Operator Telephone Ext: Not reported  
Owner/Operator Fax: Not reported  
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator  
Owner/Operator Name: ROARING FORK TRANS AUTHORITY-GMF  
Legal Status: County  
Date Became Current: 20080722  
Date Ended Current: Not reported  
Owner/Operator Address: 2307 WULFSOHN RD  
Owner/Operator City,State,Zip: GLENWOOD SPGS, CO 81601  
Owner/Operator Telephone: 970-384-4880  
Owner/Operator Telephone Ext: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ROARING FORK TRANSPORTATION AUTHORITY-GMF (Continued)**

**1011488294**

Owner/Operator Fax: Not reported  
Owner/Operator Email: Not reported

**Historic Generators:**

Receive Date: 20080722  
Handler Name: ROARING FORK TRANSPORTATION AUTHORITY-GMF  
Federal Waste Generator Description: Conditionally Exempt Small Quantity Generator  
State District Owner: Not reported  
Large Quantity Handler of Universal Waste: No  
Recognized Trader Importer: No  
Recognized Trader Exporter: No  
Spent Lead Acid Battery Importer: No  
Spent Lead Acid Battery Exporter: No  
Current Record: No  
Non Storage Recycler Activity: Not reported  
Electronic Manifest Broker: Not reported

Receive Date: 20180606  
Handler Name: ROARING FORK TRANSPORTATION AUTHORITY-GMF  
Federal Waste Generator Description: Conditionally Exempt Small Quantity Generator  
State District Owner: Not reported  
Large Quantity Handler of Universal Waste: No  
Recognized Trader Importer: No  
Recognized Trader Exporter: No  
Spent Lead Acid Battery Importer: No  
Spent Lead Acid Battery Exporter: No  
Current Record: Yes  
Non Storage Recycler Activity: No  
Electronic Manifest Broker: No

**List of NAICS Codes and Descriptions:**

NAICS Code: 48412  
NAICS Description: GENERAL FREIGHT TRUCKING, LONG-DISTANCE

**Facility Has Received Notices of Violations:**

Violations: No Violations Found

**Evaluation Action Summary:**

Evaluations: No Evaluations Found

**FINDS:**

Registry ID: 110037382338

[Click Here for FRS Facility Detail Report:](#)

**Environmental Interest/Information System:**

The Resource Conservation and Recovery Act Information System (RCRAInfo) is EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. It tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste.

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ROARING FORK TRANSPORTATION AUTHORITY-GMF (Continued)**

**1011488294**

[Click this hyperlink](#) while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

**ECHO:**

Envid: 1011488294  
Registry ID: 110037382338  
DFR URL: <http://echo.epa.gov/detailed-facility-report?fid=110037382338>  
Name: ROARING FORK TRANSPORTATION AUTHORITY-GMF  
Address: 2307 WULFSOHN RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601

**5**  
**NW**  
**1/8-1/4**  
**0.190 mi.**  
**1002 ft.**

**EIMCO COAL MACHINERY**  
**2222 DEVERUEX ROAD**  
**GLENWOOD SPRINGS, CO 81601**

**CORRACTS** **1000210929**  
**RCRA NonGen / NLR** **COD981544786**  
**FINDS**  
**ECHO**

**Relative:**  
**Lower**

**CORRACTS:**

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: AREA OF CONCERN  
Actual Date: 19900907  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

**Actual:**  
**5701 ft.**

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: OTHER REPORT RECEIVED  
Actual Date: Not reported  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: OTHER REPORT APPROVED  
Actual Date: Not reported  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: RFA INITIATION  
Actual Date: 19900907  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: RFA COMPLETED  
Actual Date: 19900907  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: NOTICE OF CONTAMINATION  
Actual Date: 19920526  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: SWMU-SUMP  
Corrective Action: CA PRIORITIZATION-LOW CA PRIORITY  
Actual Date: 19950811  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: INVESTIGATION IMPOSITION  
Actual Date: 19910724  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: SITE:GROUNDWATER  
Corrective Action: INVESTIGATION IMPOSITION  
Actual Date: 19910724  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: SWMU-SUMP  
Corrective Action: INVESTIGATION IMPOSITION  
Actual Date: 19910724  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

Name: EIMCO COAL MACHINERY  
Address: 2222 DEVERUEX RD  
Address 2: Not reported  
EPA ID: COD981544786  
Area Name: ENTIRE FACILITY  
Corrective Action: INVESTIGATION WORKPLAN RECEIVED  
Actual Date: 19920701  
Air Release Indicator: Not reported  
Groundwater Release Indicator: Y  
Soil Release Indicator: Not reported  
Surface Water Release Indicator: Not reported

[Click this hyperlink](#) while viewing on your computer to access  
65 additional CORRACTS: record(s) in the EDR Site Report.

**RCRA Listings:**

|                                      |                                 |
|--------------------------------------|---------------------------------|
| Date Form Received by Agency:        | 20020913                        |
| Handler Name:                        | Eimco Coal Machinery            |
| Handler Address:                     | Deveruex Rd                     |
| Handler City,State,Zip:              | GLENWOOD SPRINGS, CO 81601-8702 |
| EPA ID:                              | COD981544786                    |
| Contact Name:                        | DALE CRUSE                      |
| Contact Address:                     | P.O BOX 844                     |
| Contact City,State,Zip:              | GLENWOOD SPRINGS, CO 81602      |
| Contact Telephone:                   | 303-945-7836                    |
| Contact Fax:                         | Not reported                    |
| Contact Email:                       | Not reported                    |
| Contact Title:                       | Not reported                    |
| EPA Region:                          | 08                              |
| Land Type:                           | Other                           |
| Federal Waste Generator Description: | Not a generator, verified       |
| Non-Notifier:                        | Not reported                    |
| Biennial Report Cycle:               | Not reported                    |

Map ID  
Direction  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                                               |                            |
|---------------------------------------------------------------|----------------------------|
| Accessibility:                                                | Not reported               |
| Active Site Indicator:                                        | Not reported               |
| State District Owner:                                         | Co                         |
| State District:                                               | R                          |
| Mailing Address:                                              | P.O BOX 844                |
| Mailing City,State,Zip:                                       | GLENWOOD SPRINGS, CO 81602 |
| Owner Name:                                                   | Baker International        |
| Owner Type:                                                   | Private                    |
| Operator Name:                                                | Not reported               |
| Operator Type:                                                | Not reported               |
| Short-Term Generator Activity:                                | No                         |
| Importer Activity:                                            | No                         |
| Mixed Waste Generator:                                        | No                         |
| Transporter Activity:                                         | No                         |
| Transfer Facility Activity:                                   | No                         |
| Recycler Activity with Storage:                               | No                         |
| Small Quantity On-Site Burner Exemption:                      | No                         |
| Smelting Melting and Refining Furnace Exemption:              | No                         |
| Underground Injection Control:                                | No                         |
| Off-Site Waste Receipt:                                       | No                         |
| Universal Waste Indicator:                                    | No                         |
| Universal Waste Destination Facility:                         | No                         |
| Federal Universal Waste:                                      | No                         |
| Active Site State-Reg Handler:                                | ---                        |
| Federal Facility Indicator:                                   | Not reported               |
| Hazardous Secondary Material Indicator:                       | NN                         |
| Sub-Part K Indicator:                                         | Not reported               |
| 2018 GPRA Permit Baseline:                                    | Not on the Baseline        |
| 2018 GPRA Renewals Baseline:                                  | Not on the Baseline        |
| 202 GPRA Corrective Action Baseline:                          | No                         |
| Subject to Corrective Action Universe:                        | No                         |
| Non-TSDFs Where RCRA CA has Been Imposed Universe:            | Yes                        |
| Corrective Action Priority Ranking:                           | No NCAPS ranking           |
| Environmental Control Indicator:                              | No                         |
| Institutional Control Indicator:                              | No                         |
| Human Exposure Controls Indicator:                            | Yes                        |
| Groundwater Controls Indicator:                               | Yes                        |
| Significant Non-Complier Universe:                            | No                         |
| Unaddressed Significant Non-Complier Universe:                | No                         |
| Addressed Significant Non-Complier Universe:                  | No                         |
| Significant Non-Complier With a Compliance Schedule Universe: | No                         |
| Financial Assurance Required:                                 | Not reported               |
| Handler Date of Last Change:                                  | 20020913                   |
| Recognized Trader-Importer:                                   | No                         |
| Recognized Trader-Exporter:                                   | No                         |
| Importer of Spent Lead Acid Batteries:                        | No                         |
| Exporter of Spent Lead Acid Batteries:                        | No                         |
| Recycler Activity Without Storage:                            | Not reported               |
| Manifest Broker:                                              | Not reported               |
| Sub-Part P Indicator:                                         | No                         |

**Hazardous Waste Summary:**

|                    |             |
|--------------------|-------------|
| Waste Code:        | D000        |
| Waste Description: | Not Defined |
| Waste Code:        | D001        |

Map ID  
Direction  
Distance  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

Waste Description: Ignitable Waste

Handler - Owner Operator:

|                                |                              |
|--------------------------------|------------------------------|
| Owner/Operator Indicator:      | Owner                        |
| Owner/Operator Name:           | BAKER INTERNATIONAL          |
| Legal Status:                  | Private                      |
| Date Became Current:           | 18000101                     |
| Date Ended Current:            | Not reported                 |
| Owner/Operator Address:        | DATA NOT REQUESTED           |
| Owner/Operator City,State,Zip: | DATA NOT REQUESTED, CO 99999 |
| Owner/Operator Telephone:      | 999-999-9999                 |
| Owner/Operator Telephone Ext:  | Not reported                 |
| Owner/Operator Fax:            | Not reported                 |
| Owner/Operator Email:          | Not reported                 |

Historic Generators:

|                                            |                          |
|--------------------------------------------|--------------------------|
| Receive Date:                              | 19861113                 |
| Handler Name:                              | EIMCO COAL MACHINERY     |
| Federal Waste Generator Description:       | Large Quantity Generator |
| State District Owner:                      | Co                       |
| Large Quantity Handler of Universal Waste: | No                       |
| Recognized Trader Importer:                | No                       |
| Recognized Trader Exporter:                | No                       |
| Spent Lead Acid Battery Importer:          | No                       |
| Spent Lead Acid Battery Exporter:          | No                       |
| Current Record:                            | No                       |
| Non Storage Recycler Activity:             | Not reported             |
| Electronic Manifest Broker:                | Not reported             |

|                                            |                           |
|--------------------------------------------|---------------------------|
| Receive Date:                              | 20020913                  |
| Handler Name:                              | EIMCO COAL MACHINERY      |
| Federal Waste Generator Description:       | Not a generator, verified |
| State District Owner:                      | Co                        |
| Large Quantity Handler of Universal Waste: | No                        |
| Recognized Trader Importer:                | No                        |
| Recognized Trader Exporter:                | No                        |
| Spent Lead Acid Battery Importer:          | No                        |
| Spent Lead Acid Battery Exporter:          | No                        |
| Current Record:                            | Yes                       |
| Non Storage Recycler Activity:             | Not reported              |
| Electronic Manifest Broker:                | Not reported              |

List of NAICS Codes and Descriptions:

|              |                      |
|--------------|----------------------|
| NAICS Codes: | No NAICS Codes Found |
|--------------|----------------------|

Has the Facility Received Notices of Violations:

|                                    |              |
|------------------------------------|--------------|
| Found Violation:                   | No           |
| Agency Which Determined Violation: | Not reported |
| Violation Short Description:       | Not reported |
| Date Violation was Determined:     | Not reported |
| Actual Return to Compliance Date:  | Not reported |
| Return to Compliance Qualifier:    | Not reported |
| Violation Responsible Agency:      | Not reported |
| Scheduled Compliance Date:         | Not reported |
| Enforcement Identifier:            | Not reported |

Map ID  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |              |
|-------------------------------------------|--------------|
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |
| SEP Actual Date:                          | Not reported |
| SEP Defaulted Date:                       | Not reported |
| SEP Type:                                 | Not reported |
| SEP Type Description:                     | Not reported |
| Proposed Amount:                          | Not reported |
| Final Monetary Amount:                    | Not reported |
| Paid Amount:                              | Not reported |
| Final Count:                              | Not reported |
| Final Amount:                             | Not reported |
| Found Violation:                          | No           |
| Agency Which Determined Violation:        | Not reported |
| Violation Short Description:              | Not reported |
| Date Violation was Determined:            | Not reported |
| Actual Return to Compliance Date:         | Not reported |
| Return to Compliance Qualifier:           | Not reported |
| Violation Responsible Agency:             | Not reported |
| Scheduled Compliance Date:                | Not reported |
| Enforcement Identifier:                   | Not reported |
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |

Map ID  
Direction  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported  
Date of Enforcement Action: Not reported  
Enforcement Responsible Agency: Not reported  
Enforcement Docket Number: Not reported  
Enforcement Attorney: Not reported  
Corrective Action Component: Not reported  
Appeal Initiated Date: Not reported  
Appeal Resolution Date: Not reported  
Disposition Status Date: Not reported  
Disposition Status: Not reported  
Disposition Status Description: Not reported  
Consent/Final Order Sequence Number: Not reported  
Consent/Final Order Respondent Name: Not reported  
Consent/Final Order Lead Agency: Not reported  
Enforcement Type: Not reported  
Enforcement Responsible Person: Not reported  
Enforcement Responsible Sub-Organization: Not reported  
SEP Sequence Number: Not reported  
SEP Expenditure Amount: Not reported  
SEP Scheduled Completion Date: Not reported  
SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported



Map ID  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |              |
|-------------------------------------------|--------------|
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |
| SEP Actual Date:                          | Not reported |
| SEP Defaulted Date:                       | Not reported |
| SEP Type:                                 | Not reported |
| SEP Type Description:                     | Not reported |
| Proposed Amount:                          | Not reported |
| Final Monetary Amount:                    | Not reported |
| Paid Amount:                              | Not reported |
| Final Count:                              | Not reported |
| Final Amount:                             | Not reported |
| Found Violation:                          | No           |
| Agency Which Determined Violation:        | Not reported |
| Violation Short Description:              | Not reported |
| Date Violation was Determined:            | Not reported |
| Actual Return to Compliance Date:         | Not reported |
| Return to Compliance Qualifier:           | Not reported |
| Violation Responsible Agency:             | Not reported |
| Scheduled Compliance Date:                | Not reported |
| Enforcement Identifier:                   | Not reported |
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |

Map ID  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |                                |
|-------------------------------------------|--------------------------------|
| SEP Actual Date:                          | Not reported                   |
| SEP Defaulted Date:                       | Not reported                   |
| SEP Type:                                 | Not reported                   |
| SEP Type Description:                     | Not reported                   |
| Proposed Amount:                          | Not reported                   |
| Final Monetary Amount:                    | Not reported                   |
| Paid Amount:                              | Not reported                   |
| Final Count:                              | Not reported                   |
| Final Amount:                             | Not reported                   |
| Found Violation:                          | Yes                            |
| Agency Which Determined Violation:        | State                          |
| Violation Short Description:              | Generators - General           |
| Date Violation was Determined:            | 19920328                       |
| Actual Return to Compliance Date:         | 19920508                       |
| Return to Compliance Qualifier:           | Observed                       |
| Violation Responsible Agency:             | State                          |
| Scheduled Compliance Date:                | 19950415                       |
| Enforcement Identifier:                   | 000                            |
| Date of Enforcement Action:               | 19920415                       |
| Enforcement Responsible Agency:           | State                          |
| Enforcement Docket Number:                | Not reported                   |
| Enforcement Attorney:                     | CODMI                          |
| Corrective Action Component:              | No                             |
| Appeal Initiated Date:                    | Not reported                   |
| Appeal Resolution Date:                   | Not reported                   |
| Disposition Status Date:                  | Not reported                   |
| Disposition Status:                       | Not reported                   |
| Disposition Status Description:           | Not reported                   |
| Consent/Final Order Sequence Number:      | Not reported                   |
| Consent/Final Order Respondent Name:      | Not reported                   |
| Consent/Final Order Lead Agency:          | Not reported                   |
| Enforcement Type:                         | FINAL 3008(A) COMPLIANCE ORDER |
| Enforcement Responsible Person:           | COLGO                          |
| Enforcement Responsible Sub-Organization: | S                              |
| SEP Sequence Number:                      | Not reported                   |
| SEP Expenditure Amount:                   | Not reported                   |
| SEP Scheduled Completion Date:            | Not reported                   |
| SEP Actual Date:                          | Not reported                   |
| SEP Defaulted Date:                       | Not reported                   |
| SEP Type:                                 | Not reported                   |
| SEP Type Description:                     | Not reported                   |
| Proposed Amount:                          | 17100                          |
| Final Monetary Amount:                    | 17100                          |
| Paid Amount:                              | Not reported                   |
| Final Count:                              | 1                              |
| Final Amount:                             | 17100                          |
| Found Violation:                          | Unknown                        |
| Agency Which Determined Violation:        | Not reported                   |
| Violation Short Description:              | Not reported                   |
| Date Violation was Determined:            | Not reported                   |
| Actual Return to Compliance Date:         | Not reported                   |
| Return to Compliance Qualifier:           | Not reported                   |
| Violation Responsible Agency:             | Not reported                   |
| Scheduled Compliance Date:                | Not reported                   |
| Enforcement Identifier:                   | Not reported                   |

Map ID  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |              |
|-------------------------------------------|--------------|
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |
| SEP Actual Date:                          | Not reported |
| SEP Defaulted Date:                       | Not reported |
| SEP Type:                                 | Not reported |
| SEP Type Description:                     | Not reported |
| Proposed Amount:                          | Not reported |
| Final Monetary Amount:                    | Not reported |
| Paid Amount:                              | Not reported |
| Final Count:                              | Not reported |
| Final Amount:                             | Not reported |
| Found Violation:                          | No           |
| Agency Which Determined Violation:        | Not reported |
| Violation Short Description:              | Not reported |
| Date Violation was Determined:            | Not reported |
| Actual Return to Compliance Date:         | Not reported |
| Return to Compliance Qualifier:           | Not reported |
| Violation Responsible Agency:             | Not reported |
| Scheduled Compliance Date:                | Not reported |
| Enforcement Identifier:                   | Not reported |
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |

Map ID  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported  
Date of Enforcement Action: Not reported  
Enforcement Responsible Agency: Not reported  
Enforcement Docket Number: Not reported  
Enforcement Attorney: Not reported  
Corrective Action Component: Not reported  
Appeal Initiated Date: Not reported  
Appeal Resolution Date: Not reported  
Disposition Status Date: Not reported  
Disposition Status: Not reported  
Disposition Status Description: Not reported  
Consent/Final Order Sequence Number: Not reported  
Consent/Final Order Respondent Name: Not reported  
Consent/Final Order Lead Agency: Not reported  
Enforcement Type: Not reported  
Enforcement Responsible Person: Not reported  
Enforcement Responsible Sub-Organization: Not reported  
SEP Sequence Number: Not reported  
SEP Expenditure Amount: Not reported  
SEP Scheduled Completion Date: Not reported  
SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: Unknown  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported

Map ID  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |              |
|-------------------------------------------|--------------|
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |
| SEP Actual Date:                          | Not reported |
| SEP Defaulted Date:                       | Not reported |
| SEP Type:                                 | Not reported |
| SEP Type Description:                     | Not reported |
| Proposed Amount:                          | Not reported |
| Final Monetary Amount:                    | Not reported |
| Paid Amount:                              | Not reported |
| Final Count:                              | Not reported |
| Final Amount:                             | Not reported |
| Found Violation:                          | No           |
| Agency Which Determined Violation:        | Not reported |
| Violation Short Description:              | Not reported |
| Date Violation was Determined:            | Not reported |
| Actual Return to Compliance Date:         | Not reported |
| Return to Compliance Qualifier:           | Not reported |
| Violation Responsible Agency:             | Not reported |
| Scheduled Compliance Date:                | Not reported |
| Enforcement Identifier:                   | Not reported |
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |

Map ID  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported  
Date of Enforcement Action: Not reported  
Enforcement Responsible Agency: Not reported  
Enforcement Docket Number: Not reported  
Enforcement Attorney: Not reported  
Corrective Action Component: Not reported  
Appeal Initiated Date: Not reported  
Appeal Resolution Date: Not reported  
Disposition Status Date: Not reported  
Disposition Status: Not reported  
Disposition Status Description: Not reported  
Consent/Final Order Sequence Number: Not reported  
Consent/Final Order Respondent Name: Not reported  
Consent/Final Order Lead Agency: Not reported  
Enforcement Type: Not reported  
Enforcement Responsible Person: Not reported  
Enforcement Responsible Sub-Organization: Not reported  
SEP Sequence Number: Not reported  
SEP Expenditure Amount: Not reported  
SEP Scheduled Completion Date: Not reported  
SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: Yes  
Agency Which Determined Violation: State  
Violation Short Description: Generators - General  
Date Violation was Determined: 19880506  
Actual Return to Compliance Date: 19880605  
Return to Compliance Qualifier: Observed  
Violation Responsible Agency: State  
Scheduled Compliance Date: 19880605  
Enforcement Identifier: 001



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |                  |
|-------------------------------------------|------------------|
| Date of Enforcement Action:               | 19880520         |
| Enforcement Responsible Agency:           | State            |
| Enforcement Docket Number:                | Not reported     |
| Enforcement Attorney:                     | Not reported     |
| Corrective Action Component:              | No               |
| Appeal Initiated Date:                    | Not reported     |
| Appeal Resolution Date:                   | Not reported     |
| Disposition Status Date:                  | Not reported     |
| Disposition Status:                       | Not reported     |
| Disposition Status Description:           | Not reported     |
| Consent/Final Order Sequence Number:      | Not reported     |
| Consent/Final Order Respondent Name:      | Not reported     |
| Consent/Final Order Lead Agency:          | Not reported     |
| Enforcement Type:                         | WRITTEN INFORMAL |
| Enforcement Responsible Person:           | Not reported     |
| Enforcement Responsible Sub-Organization: | Not reported     |
| SEP Sequence Number:                      | Not reported     |
| SEP Expenditure Amount:                   | Not reported     |
| SEP Scheduled Completion Date:            | Not reported     |
| SEP Actual Date:                          | Not reported     |
| SEP Defaulted Date:                       | Not reported     |
| SEP Type:                                 | Not reported     |
| SEP Type Description:                     | Not reported     |
| Proposed Amount:                          | Not reported     |
| Final Monetary Amount:                    | Not reported     |
| Paid Amount:                              | Not reported     |
| Final Count:                              | Not reported     |
| Final Amount:                             | Not reported     |
| Found Violation:                          | No               |
| Agency Which Determined Violation:        | Not reported     |
| Violation Short Description:              | Not reported     |
| Date Violation was Determined:            | Not reported     |
| Actual Return to Compliance Date:         | Not reported     |
| Return to Compliance Qualifier:           | Not reported     |
| Violation Responsible Agency:             | Not reported     |
| Scheduled Compliance Date:                | Not reported     |
| Enforcement Identifier:                   | Not reported     |
| Date of Enforcement Action:               | Not reported     |
| Enforcement Responsible Agency:           | Not reported     |
| Enforcement Docket Number:                | Not reported     |
| Enforcement Attorney:                     | Not reported     |
| Corrective Action Component:              | Not reported     |
| Appeal Initiated Date:                    | Not reported     |
| Appeal Resolution Date:                   | Not reported     |
| Disposition Status Date:                  | Not reported     |
| Disposition Status:                       | Not reported     |
| Disposition Status Description:           | Not reported     |
| Consent/Final Order Sequence Number:      | Not reported     |
| Consent/Final Order Respondent Name:      | Not reported     |
| Consent/Final Order Lead Agency:          | Not reported     |
| Enforcement Type:                         | Not reported     |
| Enforcement Responsible Person:           | Not reported     |
| Enforcement Responsible Sub-Organization: | Not reported     |
| SEP Sequence Number:                      | Not reported     |
| SEP Expenditure Amount:                   | Not reported     |
| SEP Scheduled Completion Date:            | Not reported     |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported  
Date of Enforcement Action: Not reported  
Enforcement Responsible Agency: Not reported  
Enforcement Docket Number: Not reported  
Enforcement Attorney: Not reported  
Corrective Action Component: Not reported  
Appeal Initiated Date: Not reported  
Appeal Resolution Date: Not reported  
Disposition Status Date: Not reported  
Disposition Status: Not reported  
Disposition Status Description: Not reported  
Consent/Final Order Sequence Number: Not reported  
Consent/Final Order Respondent Name: Not reported  
Consent/Final Order Lead Agency: Not reported  
Enforcement Type: Not reported  
Enforcement Responsible Person: Not reported  
Enforcement Responsible Sub-Organization: Not reported  
SEP Sequence Number: Not reported  
SEP Expenditure Amount: Not reported  
SEP Scheduled Completion Date: Not reported  
SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |              |
|-------------------------------------------|--------------|
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |
| SEP Actual Date:                          | Not reported |
| SEP Defaulted Date:                       | Not reported |
| SEP Type:                                 | Not reported |
| SEP Type Description:                     | Not reported |
| Proposed Amount:                          | Not reported |
| Final Monetary Amount:                    | Not reported |
| Paid Amount:                              | Not reported |
| Final Count:                              | Not reported |
| Final Amount:                             | Not reported |
| Found Violation:                          | No           |
| Agency Which Determined Violation:        | Not reported |
| Violation Short Description:              | Not reported |
| Date Violation was Determined:            | Not reported |
| Actual Return to Compliance Date:         | Not reported |
| Return to Compliance Qualifier:           | Not reported |
| Violation Responsible Agency:             | Not reported |
| Scheduled Compliance Date:                | Not reported |
| Enforcement Identifier:                   | Not reported |
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |

Map ID  
Direction  
Distance  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported  
Date of Enforcement Action: Not reported  
Enforcement Responsible Agency: Not reported  
Enforcement Docket Number: Not reported  
Enforcement Attorney: Not reported  
Corrective Action Component: Not reported  
Appeal Initiated Date: Not reported  
Appeal Resolution Date: Not reported  
Disposition Status Date: Not reported  
Disposition Status: Not reported  
Disposition Status Description: Not reported  
Consent/Final Order Sequence Number: Not reported  
Consent/Final Order Respondent Name: Not reported  
Consent/Final Order Lead Agency: Not reported  
Enforcement Type: Not reported  
Enforcement Responsible Person: Not reported  
Enforcement Responsible Sub-Organization: Not reported  
SEP Sequence Number: Not reported  
SEP Expenditure Amount: Not reported  
SEP Scheduled Completion Date: Not reported  
SEP Actual Date: Not reported  
SEP Defaulted Date: Not reported  
SEP Type: Not reported  
SEP Type Description: Not reported  
Proposed Amount: Not reported  
Final Monetary Amount: Not reported  
Paid Amount: Not reported  
Final Count: Not reported  
Final Amount: Not reported

Found Violation: No  
Agency Which Determined Violation: Not reported  
Violation Short Description: Not reported  
Date Violation was Determined: Not reported  
Actual Return to Compliance Date: Not reported  
Return to Compliance Qualifier: Not reported  
Violation Responsible Agency: Not reported  
Scheduled Compliance Date: Not reported  
Enforcement Identifier: Not reported

Map ID  
Direction  
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Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |                                |
|-------------------------------------------|--------------------------------|
| Date of Enforcement Action:               | Not reported                   |
| Enforcement Responsible Agency:           | Not reported                   |
| Enforcement Docket Number:                | Not reported                   |
| Enforcement Attorney:                     | Not reported                   |
| Corrective Action Component:              | Not reported                   |
| Appeal Initiated Date:                    | Not reported                   |
| Appeal Resolution Date:                   | Not reported                   |
| Disposition Status Date:                  | Not reported                   |
| Disposition Status:                       | Not reported                   |
| Disposition Status Description:           | Not reported                   |
| Consent/Final Order Sequence Number:      | Not reported                   |
| Consent/Final Order Respondent Name:      | Not reported                   |
| Consent/Final Order Lead Agency:          | Not reported                   |
| Enforcement Type:                         | Not reported                   |
| Enforcement Responsible Person:           | Not reported                   |
| Enforcement Responsible Sub-Organization: | Not reported                   |
| SEP Sequence Number:                      | Not reported                   |
| SEP Expenditure Amount:                   | Not reported                   |
| SEP Scheduled Completion Date:            | Not reported                   |
| SEP Actual Date:                          | Not reported                   |
| SEP Defaulted Date:                       | Not reported                   |
| SEP Type:                                 | Not reported                   |
| SEP Type Description:                     | Not reported                   |
| Proposed Amount:                          | Not reported                   |
| Final Monetary Amount:                    | Not reported                   |
| Paid Amount:                              | Not reported                   |
| Final Count:                              | Not reported                   |
| Final Amount:                             | Not reported                   |
| Found Violation:                          | Yes                            |
| Agency Which Determined Violation:        | State                          |
| Violation Short Description:              | Generators - General           |
| Date Violation was Determined:            | 19900907                       |
| Actual Return to Compliance Date:         | 19920415                       |
| Return to Compliance Qualifier:           | Observed                       |
| Violation Responsible Agency:             | State                          |
| Scheduled Compliance Date:                | Not reported                   |
| Enforcement Identifier:                   | 000                            |
| Date of Enforcement Action:               | 19910904                       |
| Enforcement Responsible Agency:           | State                          |
| Enforcement Docket Number:                | Not reported                   |
| Enforcement Attorney:                     | CODMI                          |
| Corrective Action Component:              | No                             |
| Appeal Initiated Date:                    | Not reported                   |
| Appeal Resolution Date:                   | Not reported                   |
| Disposition Status Date:                  | Not reported                   |
| Disposition Status:                       | Not reported                   |
| Disposition Status Description:           | Not reported                   |
| Consent/Final Order Sequence Number:      | Not reported                   |
| Consent/Final Order Respondent Name:      | Not reported                   |
| Consent/Final Order Lead Agency:          | Not reported                   |
| Enforcement Type:                         | FINAL 3008(A) COMPLIANCE ORDER |
| Enforcement Responsible Person:           | COLGO                          |
| Enforcement Responsible Sub-Organization: | S                              |
| SEP Sequence Number:                      | Not reported                   |
| SEP Expenditure Amount:                   | Not reported                   |
| SEP Scheduled Completion Date:            | Not reported                   |

Map ID  
Direction  
Distance  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |                            |
|-------------------------------------------|----------------------------|
| SEP Actual Date:                          | Not reported               |
| SEP Defaulted Date:                       | Not reported               |
| SEP Type:                                 | Not reported               |
| SEP Type Description:                     | Not reported               |
| Proposed Amount:                          | Not reported               |
| Final Monetary Amount:                    | Not reported               |
| Paid Amount:                              | Not reported               |
| Final Count:                              | Not reported               |
| Final Amount:                             | Not reported               |
| Found Violation:                          | Yes                        |
| Agency Which Determined Violation:        | State                      |
| Violation Short Description:              | Generators - General       |
| Date Violation was Determined:            | 19900907                   |
| Actual Return to Compliance Date:         | 19920415                   |
| Return to Compliance Qualifier:           | Observed                   |
| Violation Responsible Agency:             | State                      |
| Scheduled Compliance Date:                | Not reported               |
| Enforcement Identifier:                   | 002                        |
| Date of Enforcement Action:               | 19910326                   |
| Enforcement Responsible Agency:           | State                      |
| Enforcement Docket Number:                | Not reported               |
| Enforcement Attorney:                     | CODMI                      |
| Corrective Action Component:              | No                         |
| Appeal Initiated Date:                    | Not reported               |
| Appeal Resolution Date:                   | Not reported               |
| Disposition Status Date:                  | Not reported               |
| Disposition Status:                       | Not reported               |
| Disposition Status Description:           | Not reported               |
| Consent/Final Order Sequence Number:      | Not reported               |
| Consent/Final Order Respondent Name:      | Not reported               |
| Consent/Final Order Lead Agency:          | Not reported               |
| Enforcement Type:                         | INITIAL 3008(A) COMPLIANCE |
| Enforcement Responsible Person:           | COLGO                      |
| Enforcement Responsible Sub-Organization: | S                          |
| SEP Sequence Number:                      | Not reported               |
| SEP Expenditure Amount:                   | Not reported               |
| SEP Scheduled Completion Date:            | Not reported               |
| SEP Actual Date:                          | Not reported               |
| SEP Defaulted Date:                       | Not reported               |
| SEP Type:                                 | Not reported               |
| SEP Type Description:                     | Not reported               |
| Proposed Amount:                          | Not reported               |
| Final Monetary Amount:                    | Not reported               |
| Paid Amount:                              | Not reported               |
| Final Count:                              | Not reported               |
| Final Amount:                             | Not reported               |
| Found Violation:                          | No                         |
| Agency Which Determined Violation:        | Not reported               |
| Violation Short Description:              | Not reported               |
| Date Violation was Determined:            | Not reported               |
| Actual Return to Compliance Date:         | Not reported               |
| Return to Compliance Qualifier:           | Not reported               |
| Violation Responsible Agency:             | Not reported               |
| Scheduled Compliance Date:                | Not reported               |
| Enforcement Identifier:                   | Not reported               |



Map ID  
Direction  
Distance  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |              |
|-------------------------------------------|--------------|
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |
| SEP Actual Date:                          | Not reported |
| SEP Defaulted Date:                       | Not reported |
| SEP Type:                                 | Not reported |
| SEP Type Description:                     | Not reported |
| Proposed Amount:                          | Not reported |
| Final Monetary Amount:                    | Not reported |
| Paid Amount:                              | Not reported |
| Final Count:                              | Not reported |
| Final Amount:                             | Not reported |
| Found Violation:                          | No           |
| Agency Which Determined Violation:        | Not reported |
| Violation Short Description:              | Not reported |
| Date Violation was Determined:            | Not reported |
| Actual Return to Compliance Date:         | Not reported |
| Return to Compliance Qualifier:           | Not reported |
| Violation Responsible Agency:             | Not reported |
| Scheduled Compliance Date:                | Not reported |
| Enforcement Identifier:                   | Not reported |
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |

Map ID  
Direction  
Distance  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |                                |
|-------------------------------------------|--------------------------------|
| SEP Actual Date:                          | Not reported                   |
| SEP Defaulted Date:                       | Not reported                   |
| SEP Type:                                 | Not reported                   |
| SEP Type Description:                     | Not reported                   |
| Proposed Amount:                          | Not reported                   |
| Final Monetary Amount:                    | Not reported                   |
| Paid Amount:                              | Not reported                   |
| Final Count:                              | Not reported                   |
| Final Amount:                             | Not reported                   |
| Found Violation:                          | Yes                            |
| Agency Which Determined Violation:        | State                          |
| Violation Short Description:              | Generators - General           |
| Date Violation was Determined:            | 19920328                       |
| Actual Return to Compliance Date:         | 19920508                       |
| Return to Compliance Qualifier:           | Observed                       |
| Violation Responsible Agency:             | State                          |
| Scheduled Compliance Date:                | 19950415                       |
| Enforcement Identifier:                   | 000                            |
| Date of Enforcement Action:               | 19920415                       |
| Enforcement Responsible Agency:           | State                          |
| Enforcement Docket Number:                | Not reported                   |
| Enforcement Attorney:                     | CODMI                          |
| Corrective Action Component:              | No                             |
| Appeal Initiated Date:                    | Not reported                   |
| Appeal Resolution Date:                   | Not reported                   |
| Disposition Status Date:                  | Not reported                   |
| Disposition Status:                       | Not reported                   |
| Disposition Status Description:           | Not reported                   |
| Consent/Final Order Sequence Number:      | Not reported                   |
| Consent/Final Order Respondent Name:      | Not reported                   |
| Consent/Final Order Lead Agency:          | Not reported                   |
| Enforcement Type:                         | FINAL 3008(A) COMPLIANCE ORDER |
| Enforcement Responsible Person:           | COLGO                          |
| Enforcement Responsible Sub-Organization: | S                              |
| SEP Sequence Number:                      | Not reported                   |
| SEP Expenditure Amount:                   | Not reported                   |
| SEP Scheduled Completion Date:            | Not reported                   |
| SEP Actual Date:                          | Not reported                   |
| SEP Defaulted Date:                       | Not reported                   |
| SEP Type:                                 | Not reported                   |
| SEP Type Description:                     | Not reported                   |
| Proposed Amount:                          | 17100                          |
| Final Monetary Amount:                    | 17100                          |
| Paid Amount:                              | Not reported                   |
| Final Count:                              | 1                              |
| Final Amount:                             | 17100                          |
| Found Violation:                          | No                             |
| Agency Which Determined Violation:        | Not reported                   |
| Violation Short Description:              | Not reported                   |
| Date Violation was Determined:            | Not reported                   |
| Actual Return to Compliance Date:         | Not reported                   |
| Return to Compliance Qualifier:           | Not reported                   |
| Violation Responsible Agency:             | Not reported                   |
| Scheduled Compliance Date:                | Not reported                   |
| Enforcement Identifier:                   | Not reported                   |

Map ID  
Direction  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |              |
|-------------------------------------------|--------------|
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |
| SEP Actual Date:                          | Not reported |
| SEP Defaulted Date:                       | Not reported |
| SEP Type:                                 | Not reported |
| SEP Type Description:                     | Not reported |
| Proposed Amount:                          | Not reported |
| Final Monetary Amount:                    | Not reported |
| Paid Amount:                              | Not reported |
| Final Count:                              | Not reported |
| Final Amount:                             | Not reported |
| Found Violation:                          | No           |
| Agency Which Determined Violation:        | Not reported |
| Violation Short Description:              | Not reported |
| Date Violation was Determined:            | Not reported |
| Actual Return to Compliance Date:         | Not reported |
| Return to Compliance Qualifier:           | Not reported |
| Violation Responsible Agency:             | Not reported |
| Scheduled Compliance Date:                | Not reported |
| Enforcement Identifier:                   | Not reported |
| Date of Enforcement Action:               | Not reported |
| Enforcement Responsible Agency:           | Not reported |
| Enforcement Docket Number:                | Not reported |
| Enforcement Attorney:                     | Not reported |
| Corrective Action Component:              | Not reported |
| Appeal Initiated Date:                    | Not reported |
| Appeal Resolution Date:                   | Not reported |
| Disposition Status Date:                  | Not reported |
| Disposition Status:                       | Not reported |
| Disposition Status Description:           | Not reported |
| Consent/Final Order Sequence Number:      | Not reported |
| Consent/Final Order Respondent Name:      | Not reported |
| Consent/Final Order Lead Agency:          | Not reported |
| Enforcement Type:                         | Not reported |
| Enforcement Responsible Person:           | Not reported |
| Enforcement Responsible Sub-Organization: | Not reported |
| SEP Sequence Number:                      | Not reported |
| SEP Expenditure Amount:                   | Not reported |
| SEP Scheduled Completion Date:            | Not reported |

Map ID  
Direction  
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MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                        |              |
|------------------------|--------------|
| SEP Actual Date:       | Not reported |
| SEP Defaulted Date:    | Not reported |
| SEP Type:              | Not reported |
| SEP Type Description:  | Not reported |
| Proposed Amount:       | Not reported |
| Final Monetary Amount: | Not reported |
| Paid Amount:           | Not reported |
| Final Count:           | Not reported |
| Final Amount:          | Not reported |

**Evaluation Action Summary:**

|                                           |                               |
|-------------------------------------------|-------------------------------|
| Evaluation Date:                          | 19960814                      |
| Evaluation Responsible Agency:            | State                         |
| Found Violation:                          | No                            |
| Evaluation Type Description:              | FOCUSED COMPLIANCE INSPECTION |
| Evaluation Responsible Person Identifier: | COSGA                         |
| Evaluation Responsible Sub-Organization:  | S                             |
| Actual Return to Compliance Date:         | Not reported                  |
| Scheduled Compliance Date:                | Not reported                  |
| Date of Request:                          | Not reported                  |
| Date Response Received:                   | Not reported                  |
| Request Agency:                           | Not reported                  |
| Former Citation:                          | Not reported                  |

|                                           |                                         |
|-------------------------------------------|-----------------------------------------|
| Evaluation Date:                          | 19930209                                |
| Evaluation Responsible Agency:            | State                                   |
| Found Violation:                          | No                                      |
| Evaluation Type Description:              | CORRECTIVE ACTION COMPLIANCE EVALUATION |
| Evaluation Responsible Person Identifier: | COSGA                                   |
| Evaluation Responsible Sub-Organization:  | S                                       |
| Actual Return to Compliance Date:         | Not reported                            |
| Scheduled Compliance Date:                | Not reported                            |
| Date of Request:                          | Not reported                            |
| Date Response Received:                   | Not reported                            |
| Request Agency:                           | Not reported                            |
| Former Citation:                          | Not reported                            |

|                                           |                               |
|-------------------------------------------|-------------------------------|
| Evaluation Date:                          | 19940811                      |
| Evaluation Responsible Agency:            | State                         |
| Found Violation:                          | No                            |
| Evaluation Type Description:              | FOCUSED COMPLIANCE INSPECTION |
| Evaluation Responsible Person Identifier: | COSGA                         |
| Evaluation Responsible Sub-Organization:  | S                             |
| Actual Return to Compliance Date:         | Not reported                  |
| Scheduled Compliance Date:                | Not reported                  |
| Date of Request:                          | Not reported                  |
| Date Response Received:                   | Not reported                  |
| Request Agency:                           | Not reported                  |
| Former Citation:                          | Not reported                  |

|                                           |                                |
|-------------------------------------------|--------------------------------|
| Evaluation Date:                          | 19910827                       |
| Evaluation Responsible Agency:            | State                          |
| Found Violation:                          | No                             |
| Evaluation Type Description:              | COMPLIANCE SCHEDULE EVALUATION |
| Evaluation Responsible Person Identifier: | COLGO                          |
| Evaluation Responsible Sub-Organization:  | S                              |
| Actual Return to Compliance Date:         | Not reported                   |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |                               |
|-------------------------------------------|-------------------------------|
| Scheduled Compliance Date:                | Not reported                  |
| Date of Request:                          | Not reported                  |
| Date Response Received:                   | Not reported                  |
| Request Agency:                           | Not reported                  |
| Former Citation:                          | Not reported                  |
| Evaluation Date:                          | 19960522                      |
| Evaluation Responsible Agency:            | State                         |
| Found Violation:                          | No                            |
| Evaluation Type Description:              | FOCUSED COMPLIANCE INSPECTION |
| Evaluation Responsible Person Identifier: | COSGA                         |
| Evaluation Responsible Sub-Organization:  | S                             |
| Actual Return to Compliance Date:         | Not reported                  |
| Scheduled Compliance Date:                | Not reported                  |
| Date of Request:                          | Not reported                  |
| Date Response Received:                   | Not reported                  |
| Request Agency:                           | Not reported                  |
| Former Citation:                          | Not reported                  |
| Evaluation Date:                          | 19890811                      |
| Evaluation Responsible Agency:            | State                         |
| Found Violation:                          | Yes                           |
| Evaluation Type Description:              | FOCUSED COMPLIANCE INSPECTION |
| Evaluation Responsible Person Identifier: | CODMA                         |
| Evaluation Responsible Sub-Organization:  | S                             |
| Actual Return to Compliance Date:         | 19920508                      |
| Scheduled Compliance Date:                | 19950415                      |
| Date of Request:                          | Not reported                  |
| Date Response Received:                   | Not reported                  |
| Request Agency:                           | Not reported                  |
| Former Citation:                          | Not reported                  |
| Evaluation Date:                          | 19990520                      |
| Evaluation Responsible Agency:            | State                         |
| Found Violation:                          | Undetermined                  |
| Evaluation Type Description:              | FOCUSED COMPLIANCE INSPECTION |
| Evaluation Responsible Person Identifier: | COWAV                         |
| Evaluation Responsible Sub-Organization:  | S                             |
| Actual Return to Compliance Date:         | Not reported                  |
| Scheduled Compliance Date:                | Not reported                  |
| Date of Request:                          | Not reported                  |
| Date Response Received:                   | Not reported                  |
| Request Agency:                           | Not reported                  |
| Former Citation:                          | Not reported                  |
| Evaluation Date:                          | 19970620                      |
| Evaluation Responsible Agency:            | State                         |
| Found Violation:                          | No                            |
| Evaluation Type Description:              | FOCUSED COMPLIANCE INSPECTION |
| Evaluation Responsible Person Identifier: | COSGA                         |
| Evaluation Responsible Sub-Organization:  | S                             |
| Actual Return to Compliance Date:         | Not reported                  |
| Scheduled Compliance Date:                | Not reported                  |
| Date of Request:                          | Not reported                  |
| Date Response Received:                   | Not reported                  |
| Request Agency:                           | Not reported                  |
| Former Citation:                          | Not reported                  |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

Evaluation Date: 19941212  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 20000501  
Evaluation Responsible Agency: State  
Found Violation: Undetermined  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COWAV  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19940421  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19950306  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19880506  
Evaluation Responsible Agency: State  
Found Violation: Yes  
Evaluation Type Description: NON-FINANCIAL RECORD REVIEW  
Evaluation Responsible Person Identifier: CONJA



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: 19880605  
Scheduled Compliance Date: 19880605  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19960710  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19940922  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19920331  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: COMPLIANCE EVALUATION INSPECTION  
Evaluation Responsible Person Identifier: COLGO  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19920505  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: NON-FINANCIAL RECORD REVIEW  
Evaluation Responsible Person Identifier: COLGO  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                                           |                                         |
|-------------------------------------------|-----------------------------------------|
| Request Agency:                           | Not reported                            |
| Former Citation:                          | Not reported                            |
| Evaluation Date:                          | 19971008                                |
| Evaluation Responsible Agency:            | State                                   |
| Found Violation:                          | No                                      |
| Evaluation Type Description:              | CORRECTIVE ACTION COMPLIANCE EVALUATION |
| Evaluation Responsible Person Identifier: | COSGA                                   |
| Evaluation Responsible Sub-Organization:  | S                                       |
| Actual Return to Compliance Date:         | Not reported                            |
| Scheduled Compliance Date:                | Not reported                            |
| Date of Request:                          | Not reported                            |
| Date Response Received:                   | Not reported                            |
| Request Agency:                           | Not reported                            |
| Former Citation:                          | Not reported                            |
| Evaluation Date:                          | 19950718                                |
| Evaluation Responsible Agency:            | State                                   |
| Found Violation:                          | No                                      |
| Evaluation Type Description:              | FOCUSED COMPLIANCE INSPECTION           |
| Evaluation Responsible Person Identifier: | COSGA                                   |
| Evaluation Responsible Sub-Organization:  | S                                       |
| Actual Return to Compliance Date:         | Not reported                            |
| Scheduled Compliance Date:                | Not reported                            |
| Date of Request:                          | Not reported                            |
| Date Response Received:                   | Not reported                            |
| Request Agency:                           | Not reported                            |
| Former Citation:                          | Not reported                            |
| Evaluation Date:                          | 19900907                                |
| Evaluation Responsible Agency:            | State                                   |
| Found Violation:                          | Yes                                     |
| Evaluation Type Description:              | COMPLIANCE EVALUATION INSPECTION        |
| Evaluation Responsible Person Identifier: | COLGO                                   |
| Evaluation Responsible Sub-Organization:  | S                                       |
| Actual Return to Compliance Date:         | 19920415                                |
| Scheduled Compliance Date:                | Not reported                            |
| Date of Request:                          | Not reported                            |
| Date Response Received:                   | Not reported                            |
| Request Agency:                           | Not reported                            |
| Former Citation:                          | Not reported                            |
| Evaluation Date:                          | 19900907                                |
| Evaluation Responsible Agency:            | State                                   |
| Found Violation:                          | Yes                                     |
| Evaluation Type Description:              | COMPLIANCE EVALUATION INSPECTION        |
| Evaluation Responsible Person Identifier: | COLGO                                   |
| Evaluation Responsible Sub-Organization:  | S                                       |
| Actual Return to Compliance Date:         | 19920415                                |
| Scheduled Compliance Date:                | Not reported                            |
| Date of Request:                          | Not reported                            |
| Date Response Received:                   | Not reported                            |
| Request Agency:                           | Not reported                            |
| Former Citation:                          | Not reported                            |
| Evaluation Date:                          | 19921124                                |
| Evaluation Responsible Agency:            | State                                   |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

Found Violation: No  
Evaluation Type Description: CORRECTIVE ACTION COMPLIANCE EVALUATION  
Evaluation Responsible Person Identifier: COLGO  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19960213  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19900907  
Evaluation Responsible Agency: State  
Found Violation: Yes  
Evaluation Type Description: COMPLIANCE EVALUATION INSPECTION  
Evaluation Responsible Person Identifier: COLGO  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: 19920508  
Scheduled Compliance Date: 19950415  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19930609  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: CORRECTIVE ACTION COMPLIANCE EVALUATION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported  
Scheduled Compliance Date: Not reported  
Date of Request: Not reported  
Date Response Received: Not reported  
Request Agency: Not reported  
Former Citation: Not reported

Evaluation Date: 19950531  
Evaluation Responsible Agency: State  
Found Violation: No  
Evaluation Type Description: FOCUSED COMPLIANCE INSPECTION  
Evaluation Responsible Person Identifier: COSGA  
Evaluation Responsible Sub-Organization: S  
Actual Return to Compliance Date: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**EIMCO COAL MACHINERY (Continued)**

**1000210929**

|                            |              |
|----------------------------|--------------|
| Scheduled Compliance Date: | Not reported |
| Date of Request:           | Not reported |
| Date Response Received:    | Not reported |
| Request Agency:            | Not reported |
| Former Citation:           | Not reported |

**FINDS:**

Registry ID: 110000738239

[Click Here for FRS Facility Detail Report:](#)

**Environmental Interest/Information System:**

The Resource Conservation and Recovery Act Information System (RCRAInfo) is EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. It tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste.

[Click this hyperlink](#) while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

**ECHO:**

|                 |                                                                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Envid:          | 1000210929                                                                                                                                |
| Registry ID:    | 110000738239                                                                                                                              |
| DFR URL:        | <a href="http://echo.epa.gov/detailed-facility-report?fid=110000738239">http://echo.epa.gov/detailed-facility-report?fid=110000738239</a> |
| Name:           | EIMCO COAL MACHINERY                                                                                                                      |
| Address:        | 2222 DEVERUEX ROAD                                                                                                                        |
| City,State,Zip: | GLENWOOD SPRINGS, CO 81601                                                                                                                |

**C6**  
**North**  
**1/8-1/4**  
**0.201 mi.**  
**1063 ft.**

**DISCOUNT TIRE**  
**51537 HWY 6**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 1 of 3 in cluster C**

**SHWF S128391493**  
**N/A**

**Relative:**  
**Lower**

|                             |                                                    |
|-----------------------------|----------------------------------------------------|
| <b>SHWF:</b>                |                                                    |
| Location ID:                | GAR25                                              |
| Facility ID:                | GAR 3878                                           |
| Name:                       | DISCOUNT TIRE                                      |
| Address:                    | 51537 HWY 6                                        |
| City,State,Zip:             | GLENWOOD SPRINGS, CO 81601                         |
| Activity Type:              | Generator of Motor Vehicle and Trailer Waste Tires |
| Contact Organization:       | Not reported                                       |
| Contact Address:            | Not reported                                       |
| Contact City,State,Zip:     | Not reported                                       |
| Contact Phone:              | Not reported                                       |
| Activity Status:            | Not reported                                       |
| Facility Status:            | Not reported                                       |
| Commercial Status:          | False                                              |
| Government Facility Status: | Not reported                                       |
| Title:                      | Not reported                                       |
| Post Closure Unit:          | False                                              |
| Post Closure Ended:         | False                                              |
| Closure Units:              | False                                              |
| Clean Closed Units:         | False                                              |
| Latitude:                   | 39.56139                                           |

**Actual:**  
**5718 ft.**

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**DISCOUNT TIRE (Continued)**

**S128391493**

Longitude: -107.354423

**C7**  
**North**  
**1/8-1/4**  
**0.201 mi.**  
**1063 ft.**  
**GLENWOOD SPRINGS CHRYSLER DODGE**  
**51537 HWY 6**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 2 of 3 in cluster C**

**AST** **A100288840**  
**N/A**

**Relative:** **AST:**  
**Lower** Name: GLENWOOD SPRINGS CHRYSLER DODGE  
Address: 51537 HWY 6  
City,State,Zip: GLENWOOD SPRINGS 81601  
Substance: LPG  
Tank Tag: 16643-1  
Facility ID: 16643  
Owner Name: Rent-x  
Owner Address: 51537 Hwy 6 & 24, Glenwood Springs, CO 81601  
Owner City: Glenwood Springs  
Owner State: CO  
Owner Zip: 81601  
Facility Type: Non-Retail  
Facility Category: LPG Only  
Capacity: 1100  
Tank Status: Permanently Closed  
Date Tank Installed: Not reported  
Date Closed: Not reported  
Tank Type: LPG-AG  
Latitude: 39.561674  
Longitude: -107.353941  
Tank Material: Not reported  
Tank Wall Type: Not reported  
Piping Type: Not reported  
Piping System: Not reported  
Piping Material: Not reported  
Piping Wall Type: Not reported  
Overfill Prevention: Not reported  
Tank ID: a1J3h000001jqS6  
Account Name: ACCT-09479

**C8**  
**North**  
**1/8-1/4**  
**0.203 mi.**  
**1070 ft.**  
**E-Z WAY RENTALS INC**  
**51517 US HWY 6 & 24**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 3 of 3 in cluster C**

**UST FINDER** **1028202536**  
**N/A**

**Relative:** **UST FINDER:**  
**Lower** Object ID: 43232  
Facility ID: CO7699  
Name: E-Z WAY RENTALS INC  
Address: 51517 US HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: StreetAddress  
Open USTs: 0  
Closed USTs: 1  
TOS USTs: 0  
Population 1500ft: 776

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**E-Z WAY RENTALS INC (Continued)**

**1028202536**

Private Wells 1500ft: 1  
Within 100yr Floodplain: No  
Land Use: Developed, Medium Intensity  
Within SPA: Yes  
SPA PWS Facility ID: CO0123185\_252  
SPA Water Type: SW - Surface Water  
SPA Facility Type: IN - Intake  
SPA HUC12: 140100050604  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Facility Status: Closed UST(s)  
Date of Last Inspection: Not reported  
EPA Region: 8  
Tribe: Not reported  
Coordinate Source: Geocode  
X Coord: -107.354776  
Y Coord: 39.5614340000001  
Latitude: 39.561434  
Longitude: -107.354776

**UST FINDER:**

Object ID: 144370  
Facility ID: CO7699  
Tank ID: CO7699-1  
Tank Status: Closed  
Installation Date: Not reported  
Removal Date: Not reported  
Tank Capacity: 560  
Substances: Waste Oil  
Tank Wall Type: Single

**9**  
**NNE**  
**1/8-1/4**  
**0.207 mi.**  
**1095 ft.**

**SALLY BEAUTY SUPPLY #10201**  
**20 MARKET ST UNIT C**  
**GLENWOOD SPRINGS, CO 81601**

**RCRA-VSQG 1026724219**  
**COR000253120**

**Relative:**  
**Lower**  
**Actual:**  
**5731 ft.**

**RCRA Listings:**

Date Form Received by Agency: 20201206  
Handler Name: Sally Beauty Supply #10201  
Handler Address: Market St Unit C  
Handler City,State,Zip: GLENWOOD SPRINGS, CO 81601  
EPA ID: COR000253120  
Contact Name: DEBBIE MIDDLETON  
Contact Address: COLORADO BLVD  
Contact City,State,Zip: DENTON, TX 76210  
Contact Telephone: 940-297-4964  
Contact Fax: Not reported  
Contact Email: DMIDDLETON@SALLYBEAUTY.COM  
Contact Title: ENVIRONMENTAL AND REGULATORY COMP. SPECIALIST  
EPA Region: 08  
Land Type: Private  
Federal Waste Generator Description: Conditionally Exempt Small Quantity Generator  
Non-Notifier: Not reported



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**SALLY BEAUTY SUPPLY #10201 (Continued)**

**1026724219**

|                                                               |                         |
|---------------------------------------------------------------|-------------------------|
| Biennial Report Cycle:                                        | Not reported            |
| Accessibility:                                                | Not reported            |
| Active Site Indicator:                                        | Handler Activities      |
| State District Owner:                                         | Not reported            |
| State District:                                               | Not reported            |
| Mailing Address:                                              | GREY HAWK CT STE 200    |
| Mailing City,State,Zip:                                       | CARLSBAD, CA 92010      |
| Owner Name:                                                   | Wmg Meadows Llc         |
| Owner Type:                                                   | Private                 |
| Operator Name:                                                | Sally Beauty Supply Llc |
| Operator Type:                                                | Private                 |
| Short-Term Generator Activity:                                | No                      |
| Importer Activity:                                            | No                      |
| Mixed Waste Generator:                                        | No                      |
| Transporter Activity:                                         | No                      |
| Transfer Facility Activity:                                   | No                      |
| Recycler Activity with Storage:                               | No                      |
| Small Quantity On-Site Burner Exemption:                      | No                      |
| Smelting Melting and Refining Furnace Exemption:              | No                      |
| Underground Injection Control:                                | No                      |
| Off-Site Waste Receipt:                                       | No                      |
| Universal Waste Indicator:                                    | No                      |
| Universal Waste Destination Facility:                         | No                      |
| Federal Universal Waste:                                      | No                      |
| Active Site State-Reg Handler:                                | ---                     |
| Federal Facility Indicator:                                   | Not reported            |
| Hazardous Secondary Material Indicator:                       | N                       |
| Sub-Part K Indicator:                                         | Not reported            |
| 2018 GPRA Permit Baseline:                                    | Not on the Baseline     |
| 2018 GPRA Renewals Baseline:                                  | Not on the Baseline     |
| 202 GPRA Corrective Action Baseline:                          | No                      |
| Subject to Corrective Action Universe:                        | No                      |
| Non-TSDFs Where RCRA CA has Been Imposed Universe:            | No                      |
| Corrective Action Priority Ranking:                           | No NCAPS ranking        |
| Environmental Control Indicator:                              | No                      |
| Institutional Control Indicator:                              | No                      |
| Human Exposure Controls Indicator:                            | N/A                     |
| Groundwater Controls Indicator:                               | N/A                     |
| Significant Non-Complier Universe:                            | No                      |
| Unaddressed Significant Non-Complier Universe:                | No                      |
| Addressed Significant Non-Complier Universe:                  | No                      |
| Significant Non-Complier With a Compliance Schedule Universe: | No                      |
| Financial Assurance Required:                                 | Not reported            |
| Handler Date of Last Change:                                  | 20201218                |
| Recognized Trader-Importer:                                   | No                      |
| Recognized Trader-Exporter:                                   | No                      |
| Importer of Spent Lead Acid Batteries:                        | No                      |
| Exporter of Spent Lead Acid Batteries:                        | No                      |
| Recycler Activity Without Storage:                            | No                      |
| Manifest Broker:                                              | No                      |
| Sub-Part P Indicator:                                         | No                      |

Hazardous Waste Summary:

|                    |                 |
|--------------------|-----------------|
| Waste Code:        | D001            |
| Waste Description: | Ignitable Waste |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**SALLY BEAUTY SUPPLY #10201 (Continued)**

**1026724219**

|                    |                                                                  |
|--------------------|------------------------------------------------------------------|
| Waste Code:        | D002                                                             |
| Waste Description: | Corrosive Waste                                                  |
| Waste Code:        | D005                                                             |
| Waste Description: | Barium                                                           |
| Waste Code:        | D007                                                             |
| Waste Description: | Chromium                                                         |
| Waste Code:        | D008                                                             |
| Waste Description: | Lead                                                             |
| Waste Code:        | D009                                                             |
| Waste Description: | Mercury                                                          |
| Waste Code:        | D011                                                             |
| Waste Description: | Silver                                                           |
| Waste Code:        | D018                                                             |
| Waste Description: | Benzene                                                          |
| Waste Code:        | D035                                                             |
| Waste Description: | Methyl Ethyl Ketone                                              |
| Waste Code:        | U002                                                             |
| Waste Description: | 2-Propanone (I) (Or) Acetone (I)                                 |
| Waste Code:        | U112                                                             |
| Waste Description: | Acetic Acid, Ethyl Ester (I) (Or) Ethyl Acetate (I)              |
| Waste Code:        | U118                                                             |
| Waste Description: | 2-Propenoic Acid, 2-Methyl-, Ethyl Ester (Or) Ethyl Methacrylate |
| Waste Code:        | U123                                                             |
| Waste Description: | Formic Acid (C,T)                                                |
| Waste Code:        | U154                                                             |
| Waste Description: | Methanol (I) (Or) Methyl Alcohol (I)                             |

**Handler - Owner Operator:**

|                                |                         |
|--------------------------------|-------------------------|
| Owner/Operator Indicator:      | Operator                |
| Owner/Operator Name:           | SALLY BEAUTY SUPPLY LLC |
| Legal Status:                  | Private                 |
| Date Became Current:           | 20120518                |
| Date Ended Current:            | Not reported            |
| Owner/Operator Address:        | 3001 COLORADO BLVD      |
| Owner/Operator City,State,Zip: | DENTON, TX 76210        |
| Owner/Operator Telephone:      | Not reported            |
| Owner/Operator Telephone Ext:  | Not reported            |
| Owner/Operator Fax:            | Not reported            |
| Owner/Operator Email:          | Not reported            |

|                           |                 |
|---------------------------|-----------------|
| Owner/Operator Indicator: | Owner           |
| Owner/Operator Name:      | WMG MEADOWS LLC |
| Legal Status:             | Private         |
| Date Became Current:      | 20120518        |
| Date Ended Current:       | Not reported    |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**SALLY BEAUTY SUPPLY #10201 (Continued)**

**1026724219**

Owner/Operator Address: 6900 E BELLEVIEW AVE #300  
Owner/Operator City,State,Zip: ENGLEWOOD, CO 80111  
Owner/Operator Telephone: 303-996-6300  
Owner/Operator Telephone Ext: Not reported  
Owner/Operator Fax: Not reported  
Owner/Operator Email: Not reported

Historic Generators:

Receive Date: 20201206  
Handler Name: SALLY BEAUTY SUPPLY #10201  
Federal Waste Generator Description: Conditionally Exempt Small Quantity Generator  
State District Owner: Not reported  
Large Quantity Handler of Universal Waste: No  
Recognized Trader Importer: No  
Recognized Trader Exporter: No  
Spent Lead Acid Battery Importer: No  
Spent Lead Acid Battery Exporter: No  
Current Record: Yes  
Non Storage Recycler Activity: No  
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:

NAICS Code: 446120  
NAICS Description: COSMETICS, BEAUTY SUPPLIES, AND PERFUME STORES

Facility Has Received Notices of Violations:

Violations: No Violations Found

Evaluation Action Summary:

Evaluations: No Evaluations Found

**D10**  
**North**  
**1/8-1/4**  
**0.213 mi.**  
**1123 ft.**  
**E-Z WAY RENTALS INC**  
**51517 US HWY 6 & 24**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 1 of 3 in cluster D**

**UST** **U003196031**  
**N/A**

**Relative:**  
**Lower**  
**Actual:**  
**5717 ft.**

UST:  
Tank Tag: 7699-1  
Substance: USED OIL  
Name: E-Z WAY RENTALS INC  
Address: 51517 US HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 7699-1  
Substance: USED OIL  
Facility ID: 7699  
Owner Name: Valley Petroleum 1981  
Owner Address: 51517 Hwy 6 & 24, Glenwood Springs, CO 81601  
Owner City: Glenwood Springs  
Owner State: CO  
Owner Zip: 81601  
Facility Type: Non-Retail  
Facility Category: Commercial/Industrial  
Capacity: 560  
Date Closed: 07/01/1996

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**E-Z WAY RENTALS INC (Continued)**

**U003196031**

Tank Status: Permanently Closed  
Date Tank Installed: Not reported  
Tank Type: UST  
Latitude: 39.56136  
Longitude: -107.355  
Tank Material: Asphalt Coated or Bare Steel  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: Bare Steel  
Piping Wall Type: None  
Overfill Prevention: Not reported  
Tank ID: a1J3h000001jmh4  
Account Name: ACCT-12040

**D11**  
**North**  
**1/8-1/4**  
**0.216 mi.**  
**1140 ft.**

**EZ WAY RENTALS INC**  
**51527 US HWY 6**  
**GLENWOOD SPRINGS, CO 81601**

**LTANKS S125420584**  
**N/A**

**Site 2 of 3 in cluster D**

**Relative:**  
**Lower**

LTANKS:  
Facility ID: 13718  
Name: EZ WAY RENTALS INC  
Address: 51527 US HWY 6  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Pre-RBCA  
Status: Closed  
Event ID: 1414  
Release Date: Not reported  
Closed Date: 08/05/1996  
Contact: Robert Shoup  
Phone: (303) 318-8547  
Email: cdle\_ops\_public\_record\_center@state.co.us  
Release Source: Not reported  
Release Cause: Not reported  
Reimbursement Total: Not reported  
Release Number: REL-001578  
URL: <https://socgov18.force.com/s/release/a183h000003KVfQ>

Facility ID: 13718  
Name: EZ WAY RENTALS INC  
Address: 51527 US HWY 6  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Pre-RBCA  
Status: Closed  
Event ID: 1462  
Release Date: 11/13/1996  
Closed Date: 04/29/1997  
Contact: Robert Shoup  
Phone: (303) 318-8547  
Email: cdle\_ops\_public\_record\_center@state.co.us  
Release Source: Not reported  
Release Cause: Not reported  
Reimbursement Total: Not reported  
Release Number: REL-001579  
URL: <https://socgov18.force.com/s/release/a183h000003KVfR>

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**12**  
**NNW**  
**1/8-1/4**  
**0.230 mi.**  
**1212 ft.**

**MCD AUTOMOTIVE INTERESTS COLORADO LLC**  
**51429 HWY 6**  
**GLENWOOD SPRINGS, CO 81601**

**SHWF** **S128391492**  
**N/A**

**Relative:**  
**Lower**

SHWF:

**Actual:**  
**5717 ft.**

Location ID: GAR24  
Facility ID: GAR 3876  
Name: MCD AUTOMOTIVE INTERESTS COLORADO LLC  
Address: 51429 HWY 6  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Activity Type: Generator of Motor Vehicle and Trailer Waste Tires  
Contact Organization: Not reported  
Contact Address: Not reported  
Contact City,State,Zip: Not reported  
Contact Phone: Not reported  
Activity Status: Not reported  
Facility Status: Not reported  
Commercial Status: False  
Government Facility Status: Not reported  
Title: Not reported  
Post Closure Unit: False  
Post Closure Ended: False  
Closure Units: False  
Clean Closed Units: False  
Latitude: 39.56147  
Longitude: -107.35611

**D13**  
**North**  
**1/8-1/4**  
**0.242 mi.**  
**1279 ft.**

**REY MOTORS INC**  
**51457 HWY 6 & 24**  
**GLENWOOD SPRINGS, CO 81601**

**Site 3 of 3 in cluster D**

**UST FINDER** **1028198900**  
**UST FINDER RELEASE** **N/A**

**Relative:**  
**Lower**

UST FINDER:

**Actual:**  
**5723 ft.**

Object ID: 43238  
Facility ID: CO3899  
Name: REY MOTORS INC  
Address: 51457 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: PointAddress  
Open USTs: 0  
Closed USTs: 1  
TOS USTs: 0  
Population 1500ft: 885  
Private Wells 1500ft: 2  
Within 100yr Floodplain: No  
Land Use: Developed, Medium Intensity  
Within SPA: Yes  
SPA PWS Facility ID: CO0123185\_252  
SPA Water Type: SW - Surface Water  
SPA Facility Type: IN - Intake  
SPA HUC12: 140100050604  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Facility Status: Closed UST(s)

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**REY MOTORS INC (Continued)**

**1028198900**

Date of Last Inspection: Not reported  
EPA Region: 8  
Tribe: Not reported  
Coordinate Source: Geocode  
X Coord: -107.355384  
Y Coord: 39.56191200000001  
Latitude: 39.561912  
Longitude: -107.355384

**UST FINDER:**

Object ID: 131147  
Facility ID: CO3899  
Tank ID: CO3899-1  
Tank Status: Closed  
Installation Date: 1974/04/24 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 500  
Substances: Waste Oil  
Tank Wall Type: Single

**UST FINDER RELEASE:**

Object ID: 75932  
Facility ID: CO3899  
Lust ID: CO1700  
Name: REY MOTORS INC  
Address: 51457 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: PointAddress  
Reported Date: Not reported  
Status: No Further Action  
Substance: Not reported  
Population within 1500ft: 824  
Domestic Wells within 1500ft: 1  
Land Use: Developed, Medium Intensity  
Within SPA: Yes  
SPA PWS Facility ID: CO0123185\_252  
SPA Water Type: SW - SurRELEASEe Water  
SPA Facility Type: IN - Intake  
SPA HUC12: 140100050604  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Within 100yr Floodplain: No  
Tribe: Not reported  
EPA Region: 8  
NFA Letter 1: Not reported  
NFA Letter 2: Not reported  
NFA Letter 3: Not reported  
NFA Letter 4: Not reported  
Closed With Residual Contaminate: Not reported  
Coordinate Source: Geocode  
X Coord: -107.3554  
Y Coord: 39.56142000000001  
Latitude: 39.56141999999999



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**REY MOTORS INC (Continued)**

**1028198900**

Longitude: -107.3554

**14**  
**NW**  
**1/4-1/2**  
**0.274 mi.**  
**1446 ft.**

**7-ELEVEN #17211**  
**51315 HWY 6**  
**GLENWOOD SPRINGS, CO 81601**

**UST FINDER 1028203967**  
**UST FINDER RELEASE N/A**

**Relative:**  
**Lower**  
**Actual:**  
**5718 ft.**

UST FINDER:  
Object ID: 43236  
Facility ID: CO9092  
Name: 7-ELEVEN #17211  
Address: 51315 HWY 6  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: Not reported  
Open USTs: 2  
Closed USTs: 0  
TOS USTs: 0  
Population 1500ft: 823  
Private Wells 1500ft: 1  
Within 100yr Floodplain: No  
Land Use: Developed, High Intensity  
Within SPA: Yes  
SPA PWS Facility ID: CO0123185\_252  
SPA Water Type: SW - Surface Water  
SPA Facility Type: IN - Intake  
SPA HUC12: 140100050604  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Facility Status: Open UST(s)  
Date of Last Inspection: Not reported  
EPA Region: 8  
Tribe: Not reported  
Coordinate Source: State  
X Coord: -107.357848  
Y Coord: 39.5618390000001  
Latitude: 39.561839  
Longitude: -107.357848

UST FINDER:  
Object ID: 122005  
Facility ID: CO9092  
Tank ID: CO9092-1  
Tank Status: Open  
Installation Date: 1986/04/17 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 10000  
Substances: Gasoline - Unleaded Regular (RUL)  
Tank Wall Type: Single  
  
Object ID: 122006  
Facility ID: CO9092  
Tank ID: CO9092-2  
Tank Status: Open  
Installation Date: 1986/04/17 16:00:00+00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**7-ELEVEN #17211 (Continued)**

**1028203967**

Removal Date: Not reported  
Tank Capacity: 10000  
Substances: Gasoline - Premium (PUL)  
Tank Wall Type: Single

**UST FINDER RELEASE:**

Object ID: 75931  
Facility ID: CO9092  
Lust ID: CO8173  
Name: 7-ELEVEN #17211  
Address: 51315 HWY 6  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: Not reported  
Reported Date: Not reported  
Status: No Further Action  
Substance: Not reported  
Population within 1500ft: 823  
Domestic Wells within 1500ft: 1  
Land Use: Developed, High Intensity  
Within SPA: Yes  
SPA PWS Facility ID: CO0123185\_252  
SPA Water Type: SW - SurRELEASEe Water  
SPA Facility Type: IN - Intake  
SPA HUC12: 140100050604  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Within 100yr Floodplain: No  
Tribe: Not reported  
EPA Region: 8  
NFA Letter 1: Not reported  
NFA Letter 2: Not reported  
NFA Letter 3: Not reported  
NFA Letter 4: Not reported  
Closed With Residual Contaminate: Not reported  
Coordinate Source: State  
X Coord: -107.35785  
Y Coord: 39.5618400000001  
Latitude: 39.5618399999999  
Longitude: -107.357849999999

**E15**  
**NW**  
**1/4-1/2**  
**0.387 mi.**  
**2045 ft.**  
**ALTA CONVENIENCE #6318**  
**51171 HWY 6 & 24**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 1 of 4 in cluster E**

**LTANKS**  
**LUST**  
**UST**  
**ASBESTOS**  
**U003241456**  
**N/A**

**Relative:**  
**Lower**  
**Actual:**  
**5710 ft.**  
LTANKS:  
Facility ID: 9009  
Name: ALTA CONVENIENCE #6318  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Tier III  
Status: Closed

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6318 (Continued)**

**U003241456**

Event ID: 7591  
Release Date: 08/04/1999  
Closed Date: 09/07/2016  
Contact: Julia Fraser  
Phone: (720) 326-1997  
Email: julia.fraser@state.co.us  
Release Source: Dispenser  
Release Cause: Not reported  
Reimbursement Total: Not reported  
Release Number: REL-011726  
URL: https://socgov18.force.com/s/release/a183h000003KYJ6

**LUST:**

Name: TOMAHAWK TRUCK STOP  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility Id: 9009  
**Status: Closed**  
Event ID: 7591  
Confirmed Release: 08/04/1999  
Contact Name: Julia Fraser  
Contact Phone: 303-318-8504  
Contact Email: Not reported  
Latitude Degrees: 39.561668  
Longitude Degrees: -107.360989

[Click here for COSTIS:](#)

**UST:**

Tank Tag: 9009-10  
Substance: DSL2/DEF/PUL  
Name: ALTA CONVENIENCE #6318  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 9009-10  
Substance: DSL2/DEF/PUL  
Facility ID: 9009  
Owner Name: Rich Sprester  
Owner Address: 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111  
Owner City: Greenwood Village  
Owner State: CO  
Owner Zip: 80111  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 16000  
Date Closed: Not reported  
Tank Status: Currently In Use  
Date Tank Installed: 12/05/2013  
Tank Type: UST  
Latitude: 39.561668  
Longitude: -107.360989  
Tank Material: FRP: Fiberglass Reinforced Plastic  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FLEX: Flexible Plastic

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6318 (Continued)**

**U003241456**

|                      |                                                          |
|----------------------|----------------------------------------------------------|
| Piping Wall Type:    | Double-Walled                                            |
| Overfill Prevention: | BF: Ball Float Valve                                     |
| Tank ID:             | a1J3h000001jmKV                                          |
| Account Name:        | ACCT-04396                                               |
| Tank Tag:            | 9009-10                                                  |
| Substance:           | DSL2/DEF/PUL                                             |
| Name:                | ALTA CONVENIENCE #6318                                   |
| Address:             | 51171 HWY 6 & 24                                         |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                                   |
| Tank Tag:            | 9009-10                                                  |
| Substance:           | DSL2/DEF/PUL                                             |
| Facility ID:         | 9009                                                     |
| Owner Name:          | Rich Spresser                                            |
| Owner Address:       | 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111 |
| Owner City:          | Greenwood Village                                        |
| Owner State:         | CO                                                       |
| Owner Zip:           | 80111                                                    |
| Facility Type:       | Retail                                                   |
| Facility Category:   | Retail Gas Station                                       |
| Capacity:            | 16000                                                    |
| Date Closed:         | Not reported                                             |
| Tank Status:         | Currently In Use                                         |
| Date Tank Installed: | 12/05/2013                                               |
| Tank Type:           | UST                                                      |
| Latitude:            | 39.561668                                                |
| Longitude:           | -107.360989                                              |
| Tank Material:       | FRP: Fiberglass Reinforced Plastic                       |
| Tank Wall Type:      | Not reported                                             |
| Piping Type:         | UG: Underground                                          |
| Piping System:       | Not reported                                             |
| Piping Material:     | FLEX: Flexible Plastic                                   |
| Piping Wall Type:    | Double-Walled                                            |
| Overfill Prevention: | BF: Ball Float Valve                                     |
| Tank ID:             | a1J3h000001jmKV                                          |
| Account Name:        | ACCT-04396                                               |
| Tank Tag:            | 9009-1                                                   |
| Substance:           | RUL                                                      |
| Name:                | ALTA CONVENIENCE #6318                                   |
| Address:             | 51171 HWY 6 & 24                                         |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                                   |
| Tank Tag:            | 9009-1                                                   |
| Substance:           | RUL                                                      |
| Facility ID:         | 9009                                                     |
| Owner Name:          | Rich Spresser                                            |
| Owner Address:       | 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111 |
| Owner City:          | Greenwood Village                                        |
| Owner State:         | CO                                                       |
| Owner Zip:           | 80111                                                    |
| Facility Type:       | Retail                                                   |
| Facility Category:   | Retail Gas Station                                       |
| Capacity:            | 10000                                                    |
| Date Closed:         | 10/08/2012                                               |
| Tank Status:         | Permanently Closed                                       |
| Date Tank Installed: | 03/10/1974                                               |
| Tank Type:           | UST                                                      |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6318 (Continued)**

**U003241456**

Latitude: 39.561668  
Longitude: -107.360989  
Tank Material: ST: Cathodically Protected Steel  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FRP: Fiberglass Reinforced Plastic  
Piping Wall Type: None  
Overfill Prevention: FV: Fill Tube Valve  
Tank ID: a1J3h000001jmKU  
Account Name: ACCT-04396

Tank Tag: 9009-6  
Substance: DSL  
Name: ALTA CONVENIENCE #6318  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 9009-6  
Substance: DSL  
Facility ID: 9009  
Owner Name: Rich Sprester  
Owner Address: 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111  
Owner City: Greenwood Village  
Owner State: CO  
Owner Zip: 80111  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 10000  
Date Closed: 10/10/2012  
Tank Status: Permanently Closed  
Date Tank Installed: 03/10/1978  
Tank Type: UST  
Latitude: 39.561668  
Longitude: -107.360989  
Tank Material: ST: Cathodically Protected Steel  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FRP: Fiberglass Reinforced Plastic  
Piping Wall Type: None  
Overfill Prevention: FV: Fill Tube Valve  
Tank ID: a1J3h000001jmKa  
Account Name: ACCT-04396

Tank Tag: 9009-4  
Substance: PUL  
Name: ALTA CONVENIENCE #6318  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 9009-4  
Substance: PUL  
Facility ID: 9009  
Owner Name: Rich Sprester  
Owner Address: 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111  
Owner City: Greenwood Village  
Owner State: CO  
Owner Zip: 80111

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6318 (Continued)**

**U003241456**

|                      |                                                          |
|----------------------|----------------------------------------------------------|
| Facility Type:       | Retail                                                   |
| Facility Category:   | Retail Gas Station                                       |
| Capacity:            | 6000                                                     |
| Date Closed:         | 10/10/2012                                               |
| Tank Status:         | Permanently Closed                                       |
| Date Tank Installed: | 03/10/1978                                               |
| Tank Type:           | UST                                                      |
| Latitude:            | 39.561668                                                |
| Longitude:           | -107.360989                                              |
| Tank Material:       | ST: Cathodically Protected Steel                         |
| Tank Wall Type:      | Not reported                                             |
| Piping Type:         | UG: Underground                                          |
| Piping System:       | Not reported                                             |
| Piping Material:     | FRP: Fiberglass Reinforced Plastic                       |
| Piping Wall Type:    | None                                                     |
| Overfill Prevention: | FV: Fill Tube Valve                                      |
| Tank ID:             | a1J3h000001jmKY                                          |
| Account Name:        | ACCT-04396                                               |
| Tank Tag:            | 9009-3                                                   |
| Substance:           | DSL                                                      |
| Name:                | ALTA CONVENIENCE #6318                                   |
| Address:             | 51171 HWY 6 & 24                                         |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                                   |
| Tank Tag:            | 9009-3                                                   |
| Substance:           | DSL                                                      |
| Facility ID:         | 9009                                                     |
| Owner Name:          | Rich Spresser                                            |
| Owner Address:       | 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111 |
| Owner City:          | Greenwood Village                                        |
| Owner State:         | CO                                                       |
| Owner Zip:           | 80111                                                    |
| Facility Type:       | Retail                                                   |
| Facility Category:   | Retail Gas Station                                       |
| Capacity:            | 6000                                                     |
| Date Closed:         | 10/10/2012                                               |
| Tank Status:         | Permanently Closed                                       |
| Date Tank Installed: | 03/10/1978                                               |
| Tank Type:           | UST                                                      |
| Latitude:            | 39.561668                                                |
| Longitude:           | -107.360989                                              |
| Tank Material:       | ST: Cathodically Protected Steel                         |
| Tank Wall Type:      | Not reported                                             |
| Piping Type:         | UG: Underground                                          |
| Piping System:       | Not reported                                             |
| Piping Material:     | FRP: Fiberglass Reinforced Plastic                       |
| Piping Wall Type:    | None                                                     |
| Overfill Prevention: | FV: Fill Tube Valve                                      |
| Tank ID:             | a1J3h000001jmKX                                          |
| Account Name:        | ACCT-04396                                               |
| Tank Tag:            | 9009-2                                                   |
| Substance:           | RUL                                                      |
| Name:                | ALTA CONVENIENCE #6318                                   |
| Address:             | 51171 HWY 6 & 24                                         |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                                   |
| Tank Tag:            | 9009-2                                                   |



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6318 (Continued)**

**U003241456**

Substance: RUL  
Facility ID: 9009  
Owner Name: Rich Sprester  
Owner Address: 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111  
Owner City: Greenwood Village  
Owner State: CO  
Owner Zip: 80111  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 8000  
Date Closed: 10/08/2012  
Tank Status: Permanently Closed  
Date Tank Installed: 03/10/1974  
Tank Type: UST  
Latitude: 39.561668  
Longitude: -107.360989  
Tank Material: ST: Cathodically Protected Steel  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FRP: Fiberglass Reinforced Plastic  
Piping Wall Type: None  
Overfill Prevention: FV: Fill Tube Valve  
Tank ID: a1J3h000001jmKW  
Account Name: ACCT-04396

Tank Tag: 9009-10  
Substance: DSL2/DEF/PUL  
Name: ALTA CONVENIENCE #6318  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 9009-10  
Substance: DSL2/DEF/PUL  
Facility ID: 9009  
Owner Name: Rich Sprester  
Owner Address: 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111  
Owner City: Greenwood Village  
Owner State: CO  
Owner Zip: 80111  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 16000  
Date Closed: Not reported  
Tank Status: Currently In Use  
Date Tank Installed: 12/05/2013  
Tank Type: UST  
Latitude: 39.561668  
Longitude: -107.360989  
Tank Material: FRP: Fiberglass Reinforced Plastic  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FLEX: Flexible Plastic  
Piping Wall Type: Double-Walled  
Overfill Prevention: BF: Ball Float Valve  
Tank ID: a1J3h000001jmKV  
Account Name: ACCT-04396

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6318 (Continued)**

**U003241456**

Tank Tag: 9009-5  
Substance: DSL  
Name: ALTA CONVENIENCE #6318  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 9009-5  
Substance: DSL  
Facility ID: 9009  
Owner Name: Rich Spresser  
Owner Address: 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111  
Owner City: Greenwood Village  
Owner State: CO  
Owner Zip: 80111  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 6000  
Date Closed: 10/10/2012  
Tank Status: Permanently Closed  
Date Tank Installed: 03/10/1978  
Tank Type: UST  
Latitude: 39.561668  
Longitude: -107.360989  
Tank Material: ST: Cathodically Protected Steel  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FRP: Fiberglass Reinforced Plastic  
Piping Wall Type: None  
Overfill Prevention: FV: Fill Tube Valve  
Tank ID: a1J3h000001jmKZ  
Account Name: ACCT-04396

Tank Tag: 9009-9  
Substance: RUL  
Name: ALTA CONVENIENCE #6318  
Address: 51171 HWY 6 & 24  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 9009-9  
Substance: RUL  
Facility ID: 9009  
Owner Name: Rich Spresser  
Owner Address: 8400 E Prentice Ave Ste 400, Greenwood Village, CO 80111  
Owner City: Greenwood Village  
Owner State: CO  
Owner Zip: 80111  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 15000  
Date Closed: Not reported  
Tank Status: Currently In Use  
Date Tank Installed: 12/05/2013  
Tank Type: UST  
Latitude: 39.561668  
Longitude: -107.360989  
Tank Material: FRP: Fiberglass Reinforced Plastic  
Tank Wall Type: Not reported  
Piping Type: UG: Underground

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6318 (Continued)**

**U003241456**

|                      |                        |
|----------------------|------------------------|
| Piping System:       | Not reported           |
| Piping Material:     | FLEX: Flexible Plastic |
| Piping Wall Type:    | Double-Walled          |
| Overfill Prevention: | BF: Ball Float Valve   |
| Tank ID:             | a1J3h000001jmKd        |
| Account Name:        | ACCT-04396             |

**CO ASBESTOS:**

|                |                          |
|----------------|--------------------------|
| Year:          | 2013                     |
| Permit Number: | Not reported             |
| Permit Date:   | Not reported             |
| Contractor:    | David Rippy Construction |
| Project:       | 31                       |
| Linear Ft:     | Not reported             |
| Square Ft:     | Not reported             |
| Project Type:  | Demolition Projects      |
| Demo Number:   | 13GA1285D                |
| Notice Date:   | 2013-03-15 00:00:00      |
| Drums:         | Not reported             |
| Begin Date:    | Not reported             |
| End Date:      | Not reported             |

|                |                                         |
|----------------|-----------------------------------------|
| Year:          | 2014                                    |
| Permit Number: | 13GA1024N                               |
| Permit Date:   | Not reported                            |
| Contractor:    | Nelson Engineering & Construction, Inc. |
| Project:       | Not reported                            |
| Linear Ft:     | Not reported                            |
| Square Ft:     | Not reported                            |
| Project Type:  | Asbestos Abatement Projects             |
| Demo Number:   | Not reported                            |
| Notice Date:   | 2013-03-08 00:00:00                     |
| Drums:         | Not reported                            |
| Begin Date:    | Not reported                            |
| End Date:      | Not reported                            |

|                |                                          |
|----------------|------------------------------------------|
| Year:          | 2013                                     |
| Permit Number: | 13GA1024N                                |
| Permit Date:   | Not reported                             |
| Contractor:    | Nelson Engineering & Construction, Inc.* |
| Project:       | Not reported                             |
| Linear Ft:     | Not reported                             |
| Square Ft:     | Not reported                             |
| Project Type:  | Asbestos Abatement Projects              |
| Demo Number:   | Not reported                             |
| Notice Date:   | 2013-03-08 00:00:00                      |
| Drums:         | Not reported                             |
| Begin Date:    | Not reported                             |
| End Date:      | Not reported                             |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

EDR ID Number  
EPA ID Number

**E16**  
**NW**  
**1/4-1/2**  
**0.421 mi.**  
**2224 ft.**  
**Site 2 of 4 in cluster E**

**UST FINDER** **1028196213**  
**UST FINDER RELEASE** **N/A**

**Relative:**  
**Lower**

UST FINDER:

**Actual:**  
**5712 ft.**

Object ID: 43237  
Facility ID: CO1655  
Name: ALTA CONVENIENCE #6020  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: Not reported  
Open USTs: 3  
Closed USTs: 0  
TOS USTs: 0  
Population 1500ft: 545  
Private Wells 1500ft: 1  
Within 100yr Floodplain: No  
Land Use: Developed, High Intensity  
Within SPA: No  
SPA PWS Facility ID: Not reported  
SPA Water Type: Not reported  
SPA Facility Type: Not reported  
SPA HUC12: Not reported  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Facility Status: Open UST(s)  
Date of Last Inspection: Not reported  
EPA Region: 8  
Tribe: Not reported  
Coordinate Source: State  
X Coord: -107.361372  
Y Coord: 39.5618840000001  
Latitude: 39.561884  
Longitude: -107.361372

UST FINDER:

Object ID: 131749  
Facility ID: CO1655  
Tank ID: CO1655-1  
Tank Status: Open  
Installation Date: 1973/05/05 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 8000  
Substances: Gasoline - Unleaded Regular (RUL)  
Tank Wall Type: Single

Object ID: 131750  
Facility ID: CO1655  
Tank ID: CO1655-2  
Tank Status: Open  
Installation Date: 1973/05/05 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 8000  
Substances: Gasoline - Premium (PUL)  
Tank Wall Type: Single

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**ALTA CONVENIENCE #6020 (Continued)**

**1028196213**

Object ID: 127418  
Facility ID: CO1655  
Tank ID: CO1655-3  
Tank Status: Open  
Installation Date: 1979/05/06 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 3000  
Substances: Diesel  
Tank Wall Type: Single

**UST FINDER RELEASE:**

Object ID: 75928  
Facility ID: CO1655  
Lust ID: CO8047  
Name: WESTMART TEXACO  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: Not reported  
Reported Date: 1999/12/18 15:59:59+00  
Status: No Further Action  
Substance: Not reported  
Population within 1500ft: 545  
Domestic Wells within 1500ft: 1  
Land Use: Developed, High Intensity  
Within SPA: No  
SPA PWS Facility ID: Not reported  
SPA Water Type: Not reported  
SPA Facility Type: Not reported  
SPA HUC12: Not reported  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Within 100yr Floodplain: No  
Tribe: Not reported  
EPA Region: 8  
NFA Letter 1: Not reported  
NFA Letter 2: Not reported  
NFA Letter 3: Not reported  
NFA Letter 4: Not reported  
Closed With Residual Contaminate: Not reported  
Coordinate Source: State  
X Coord: -107.36137  
Y Coord: 39.56188  
Latitude: 39.56188  
Longitude: -107.361369999999

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**E17**  
**NW**  
**1/4-1/2**  
**0.421 mi.**  
**2224 ft.**  
**23 MEL REY**  
**23 MEL REY RD**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 3 of 4 in cluster E**

**LUST**  
**LUST TRUST**  
**S119772779**  
**N/A**

**Relative:**  
**Lower**

**LUST:**

**Actual:**  
**5712 ft.**

Name: WESTMART TEXACO  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility Id: 1655  
**Status: Closed**  
Event ID: 8047  
Confirmed Release: 12/18/1999  
Contact Name: Technical Assistance Line  
Contact Phone: 303-318-8547  
Contact Email: Not reported  
Latitude Degrees: 39.561884  
Longitude Degrees: -107.361372

[Click here for COSTIS:](#)

**CO LUST TRUST:**

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Pester Marketing Co  
Event ID: 13465  
RAP ID: 34391  
Cap Status: Approved  
Eligibility Type Description: Tank Owner/Operator  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Original  
RAP Status: Withdrawn  
Total Reimbursement: Not reported  
Net Reimbursement: \$0.00  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: J Garcia  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 2/12/2020, 12:00 AM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000001GcNz

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Western Petroleum Co  
Event ID: 13465  
RAP ID: 34425  
Cap Status: Approved



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

Eligibility Type Description: Tank Owner/Operator  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Original  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$29,106.46  
FPR Date: 6/19/2020  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: J Garcia  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 2/19/2020, 12:00 AM  
Committee Meeting Date: 6/19/2020  
Protest Name: Not reported  
Payment Request ID: a143h000001GhES

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Western Petroleum Co  
Event ID: 13465  
RAP ID: 34622  
Cap Status: Approved  
Eligibility Type Description: Tank Owner/Operator  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Supplemental  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$26,436.93  
FPR Date: 10/16/2020  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: J Garcia  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 3/26/2020, 12:00 AM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000001GhET

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Western Petroleum Co  
Event ID: 13465  
RAP ID: 34710  
Cap Status: Approved  
Eligibility Type Description: Tank Owner/Operator

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Supplemental  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$1,146.25  
FPR Date: 8/17/2020  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: J Garcia  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 4/20/2020, 12:00 AM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000001GhEU

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Western Petroleum Co  
Event ID: 13465  
RAP ID: 34994  
Cap Status: Approved  
Eligibility Type Description: Tank Owner/Operator  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Supplemental  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$8,886.43  
FPR Date: 11/2/2020  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: J Garcia  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 7/1/2020, 12:00 AM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000001GhEV

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Western Petroleum Co  
Event ID: 13465  
RAP ID: 35297  
Cap Status: Approved  
Eligibility Type Description: Tank Owner/Operator  
Total Percent Reduction: 0

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

Total Reimbursement for Event: 344949.59  
RAP Type Description: eRAP Supplemental  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$13,005.65  
FPR Date: 2/9/2021  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: J Garcia  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 10/2/2020, 12:00 AM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000001GhEW

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Western Petroleum Co  
Event ID: 13465  
RAP ID: 35713  
Cap Status: Approved  
Eligibility Type Description: Tank Owner/Operator  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: eRAP Supplemental  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$7,021.00  
FPR Date: 5/27/2021  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: J Garcia  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 1/28/2021, 12:00 AM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000001GhEX

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$6,201.41  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 4/10/2023, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a14Do00000od6M

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$3,909.07  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 7/6/2023, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a14Do000000UZZY

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

|                                |                            |
|--------------------------------|----------------------------|
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$5,928.86                 |
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 7/7/2023, 12:00 PM         |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a14Do000000UZub            |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$3,103.07                 |
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 8/10/2023, 12:00 PM        |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a14Do000000UcOi            |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

|                                |                            |
|--------------------------------|----------------------------|
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$36,198.31                |
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 8/9/2022, 12:00 PM         |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a143h00000bWst             |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$21,980.62                |
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 9/9/2022, 12:00 PM         |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a143h000004Kc6n            |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

Net Reimbursement: \$43,437.76  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 10/11/2022, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000004KoDW

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$3,890.63  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 1/9/2023, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000004LrJy

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$0.00

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

|                                |                            |
|--------------------------------|----------------------------|
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 12/9/2022, 12:00 PM        |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a143h000004Le85            |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$1,390.75                 |
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 3/13/2023, 12:00 PM        |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a143h000004MIs1            |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$34,733.80                |
| FPR Date:                      | Not reported               |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 11/10/2022, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000004L4X9

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$7,519.90  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 7/8/2022, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000003kgXt

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$1,987.04  
FPR Date: Not reported  
Pay Voucher Date: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

|                                |                            |
|--------------------------------|----------------------------|
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 11/10/2023, 12:00 PM       |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a14Do00000MI4P             |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$3,302.37                 |
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |
| Fund Analyst:                  | Not reported               |
| Category:                      | Retail Gas Station         |
| Technical Reviewer:            | Julia Fraser               |
| Technical Reviewer Phone:      | (720) 326-1997             |
| Fund Analyst Phone:            | (720) 582-6723             |
| Date Received by OPS:          | 9/13/2023, 12:00 PM        |
| Committee Meeting Date:        | Not reported               |
| Protest Name:                  | Not reported               |
| Payment Request ID:            | a14Do00000VC8c             |
| Name:                          | 23 MEL REY                 |
| Address:                       | 23 MEL REY RD              |
| City,State,Zip:                | GLENWOOD SPRINGS, CO 81601 |
| Facility ID:                   | 1655                       |
| Payee Name:                    | Not reported               |
| Event ID:                      | 13465                      |
| RAP ID:                        | Not reported               |
| Cap Status:                    | Approved                   |
| Eligibility Type Description:  | Not reported               |
| Total Percent Reduction:       | 0                          |
| Total Reimbursement for Event: | 344949.59                  |
| RAP Type Description:          | Not reported               |
| RAP Status:                    | Paid                       |
| Total Reimbursement:           | Not reported               |
| Net Reimbursement:             | \$70,446.14                |
| FPR Date:                      | Not reported               |
| Pay Voucher Date:              | Not reported               |
| Special Conditions:            | Not reported               |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 2/10/2023, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a143h000004M8II

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$3,227.16  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported  
Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 10/12/2023, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a14Do000000mDyn

Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility ID: 1655  
Payee Name: Not reported  
Event ID: 13465  
RAP ID: Not reported  
Cap Status: Approved  
Eligibility Type Description: Not reported  
Total Percent Reduction: 0  
Total Reimbursement for Event: 344949.59  
RAP Type Description: Not reported  
RAP Status: Paid  
Total Reimbursement: Not reported  
Net Reimbursement: \$12,089.98  
FPR Date: Not reported  
Pay Voucher Date: Not reported  
Special Conditions: Not reported  
Fund Analyst: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**S119772779**

Category: Retail Gas Station  
Technical Reviewer: Julia Fraser  
Technical Reviewer Phone: (720) 326-1997  
Fund Analyst Phone: (720) 582-6723  
Date Received by OPS: 5/10/2023, 12:00 PM  
Committee Meeting Date: Not reported  
Protest Name: Not reported  
Payment Request ID: a14Do000000oscU

[Click here for COSTIS:](#)

**E18**  
**NW**  
**1/4-1/2**  
**0.421 mi.**  
**2224 ft.**  
**23 MEL REY**  
**23 MEL REY RD**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 4 of 4 in cluster E**

**LTANKS**  
**UST**  
**U003117277**  
**N/A**

**Relative:**  
**Lower**  
**Actual:**  
**5712 ft.**

**LTANKS:**  
Facility ID: 1655  
Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: RBCA-No Tier Specified  
Status: Closed  
Event ID: 8047  
Release Date: 12/18/1999  
Closed Date: 04/13/2000  
Contact: Jane Bral  
Phone: (303) 318-8510  
Email: jane.bral@state.co.us  
Release Source: Not reported  
Release Cause: Not reported  
Reimbursement Total: Not reported  
Release Number: REL-012867  
URL: <https://socgov18.force.com/s/release/a183h000003KYbV>  
  
Facility ID: 1655  
Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Tier I  
Status: Closed  
Event ID: 17190  
Release Date: 08/08/2022  
Closed Date: 03/13/2023  
Contact: Julia Fraser  
Phone: (720) 326-1997  
Email: julia.fraser@state.co.us  
Release Source: Other  
Release Cause: Other  
Reimbursement Total: Not reported  
Release Number: REL-016155  
URL: <https://socgov18.force.com/s/release/a183h000003TTQY>  
  
Facility ID: 1655  
Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**U003117277**

NFA Type: Not reported  
Status: State Lead  
Event ID: 13465  
Release Date: 08/14/2019  
Closed Date: Not reported  
Contact: Hannah Williams  
Phone: (303) 318-8519  
Email: hannah.williams@state.co.us  
Release Source: Other  
Release Cause: Physical Damage  
Reimbursement Total: Not reported  
Release Number: REL-000284  
URL: <https://socgov18.force.com/s/release/a183h000003KVKY>

Facility ID: 1655  
Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Administrative  
Status: Closed  
Event ID: 13607  
Release Date: 11/15/2019  
Closed Date: Not reported  
Contact: Julia Fraser  
Phone: (720) 326-1997  
Email: julia.fraser@state.co.us  
Release Source: Not reported  
Release Cause: Other  
Reimbursement Total: Not reported  
Release Number: REL-000285  
URL: <https://socgov18.force.com/s/release/a183h000003KVKZ>

**UST:**

Tank Tag: 1655-1  
Substance: RUL  
Name: 23 MEL REY  
Address: 23 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 1655-1  
Substance: RUL  
Facility ID: 1655  
Owner Name: 23 Mel Ray Ventures  
Owner Address: 625 S West End St. #4, Aspen, CO 81611  
Owner City: Aspen  
Owner State: CO  
Owner Zip: 81611  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 8000  
Date Closed: Not reported  
Tank Status: Currently In Use  
Date Tank Installed: 05/05/1973  
Tank Type: UST  
Latitude: 39.561884  
Longitude: -107.361372  
Tank Material: ST: Cathodically Protected Steel  
Tank Wall Type: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**U003117277**

|                      |                                        |
|----------------------|----------------------------------------|
| Piping Type:         | UG: Underground                        |
| Piping System:       | Not reported                           |
| Piping Material:     | FRP: Fiberglass Reinforced Plastic     |
| Piping Wall Type:    | None                                   |
| Overfill Prevention: | FV: Fill Tube Valve                    |
| Tank ID:             | a1J3h000001jqMr                        |
| Account Name:        | ACCT-00049                             |
| Tank Tag:            | 1655-2                                 |
| Substance:           | PUL                                    |
| Name:                | 23 MEL REY                             |
| Address:             | 23 MEL REY RD                          |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                 |
| Tank Tag:            | 1655-2                                 |
| Substance:           | PUL                                    |
| Facility ID:         | 1655                                   |
| Owner Name:          | 23 Mel Ray Ventures                    |
| Owner Address:       | 625 S West End St. #4, Aspen, CO 81611 |
| Owner City:          | Aspen                                  |
| Owner State:         | CO                                     |
| Owner Zip:           | 81611                                  |
| Facility Type:       | Retail                                 |
| Facility Category:   | Retail Gas Station                     |
| Capacity:            | 8000                                   |
| Date Closed:         | Not reported                           |
| Tank Status:         | Currently In Use                       |
| Date Tank Installed: | 05/05/1973                             |
| Tank Type:           | UST                                    |
| Latitude:            | 39.561884                              |
| Longitude:           | -107.361372                            |
| Tank Material:       | ST: Cathodically Protected Steel       |
| Tank Wall Type:      | Not reported                           |
| Piping Type:         | UG: Underground                        |
| Piping System:       | Not reported                           |
| Piping Material:     | FRP: Fiberglass Reinforced Plastic     |
| Piping Wall Type:    | None                                   |
| Overfill Prevention: | FV: Fill Tube Valve                    |
| Tank ID:             | a1J3h000001jqMs                        |
| Account Name:        | ACCT-00049                             |
| Tank Tag:            | 1655-3                                 |
| Substance:           | DSL                                    |
| Name:                | 23 MEL REY                             |
| Address:             | 23 MEL REY RD                          |
| City,State,Zip:      | GLENWOOD SPRINGS 81601                 |
| Tank Tag:            | 1655-3                                 |
| Substance:           | DSL                                    |
| Facility ID:         | 1655                                   |
| Owner Name:          | 23 Mel Ray Ventures                    |
| Owner Address:       | 625 S West End St. #4, Aspen, CO 81611 |
| Owner City:          | Aspen                                  |
| Owner State:         | CO                                     |
| Owner Zip:           | 81611                                  |
| Facility Type:       | Retail                                 |
| Facility Category:   | Retail Gas Station                     |
| Capacity:            | 3000                                   |
| Date Closed:         | Not reported                           |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**23 MEL REY (Continued)**

**U003117277**

Tank Status: Currently In Use  
Date Tank Installed: 05/06/1979  
Tank Type: UST  
Latitude: 39.561884  
Longitude: -107.361372  
Tank Material: ST: Cathodically Protected Steel  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: FRP: Fiberglass Reinforced Plastic  
Piping Wall Type: None  
Overfill Prevention: FV: Fill Tube Valve  
Tank ID: a1J3h000001jqMt  
Account Name: ACCT-00049

**F19**  
**NW**  
**1/4-1/2**  
**0.456 mi.**  
**2409 ft.**  
**WEST CARWASH**  
**77 MEL REY RD**  
**GLENWOOD SPRINGS, CO 81601**  
**Site 1 of 2 in cluster F**

**UST FINDER 1028194377**  
**UST FINDER RELEASE N/A**

**Relative:**  
**Lower**

UST FINDER:  
Object ID: 43241  
Facility ID: CO10965  
Name: WEST CARWASH  
Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: Not reported  
Open USTs: 0  
Closed USTs: 5  
TOS USTs: 0  
Population 1500ft: 612  
Private Wells 1500ft: 2  
Within 100yr Floodplain: No  
Land Use: Developed, High Intensity  
Within SPA: No  
SPA PWS Facility ID: Not reported  
SPA Water Type: Not reported  
SPA Facility Type: Not reported  
SPA HUC12: Not reported  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Facility Status: Closed UST(s)  
Date of Last Inspection: Not reported  
EPA Region: 8  
Tribe: Not reported  
Coordinate Source: State  
X Coord: -107.361234  
Y Coord: 39.562285  
Latitude: 39.562285  
Longitude: -107.361234

UST FINDER:  
Object ID: 133947  
Facility ID: CO10965

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST CARWASH (Continued)**

**1028194377**

Tank ID: CO10965-1  
Tank Status: Closed  
Installation Date: 1970/05/01 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 6000  
Substances: Gasoline  
Tank Wall Type: Single

Object ID: 133948  
Facility ID: CO10965  
Tank ID: CO10965-2  
Tank Status: Closed  
Installation Date: 1970/05/01 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 6000  
Substances: Gasoline  
Tank Wall Type: Single

Object ID: 133949  
Facility ID: CO10965  
Tank ID: CO10965-3  
Tank Status: Closed  
Installation Date: 1970/05/01 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 2000  
Substances: Gasoline  
Tank Wall Type: Single

Object ID: 133950  
Facility ID: CO10965  
Tank ID: CO10965-4  
Tank Status: Closed  
Installation Date: 1970/05/01 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 2000  
Substances: Gasoline  
Tank Wall Type: Single

Object ID: 133951  
Facility ID: CO10965  
Tank ID: CO10965-5  
Tank Status: Closed  
Installation Date: 1970/05/01 16:00:00+00  
Removal Date: Not reported  
Tank Capacity: 6000  
Substances: Gasoline  
Tank Wall Type: Single

**UST FINDER RELEASE:**

Object ID: 75929  
Facility ID: CO10965  
Lust ID: CO666  
Name: WEST CARWASH  
Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Address Match Type: Not reported

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST CARWASH (Continued)**

**1028194377**

Reported Date: 1997/06/20 15:59:59+00  
Status: No Further Action  
Substance: Not reported  
Population within 1500ft: 614  
Domestic Wells within 1500ft: 2  
Land Use: Developed, High Intensity  
Within SPA: No  
SPA PWS Facility ID: Not reported  
SPA Water Type: Not reported  
SPA Facility Type: Not reported  
SPA HUC12: Not reported  
Within WHPA: No  
WHPA PWS Facility ID: Not reported  
WHPA Water Type: Not reported  
WHPA Facility Type: Not reported  
WHPA HUC12: Not reported  
Within 100yr Floodplain: No  
Tribe: Not reported  
EPA Region: 8  
NFA Letter 1: Not reported  
NFA Letter 2: Not reported  
NFA Letter 3: Not reported  
NFA Letter 4: Not reported  
Closed With Residual Contaminate: Not reported  
Coordinate Source: State  
X Coord: -107.36123  
Y Coord: 39.56229000000001  
Latitude: 39.56228999999999  
Longitude: -107.36123

**F20**  
**NW**  
**1/4-1/2**  
**0.456 mi.**  
**2409 ft.**

**WEST CARWASH**  
**77 MEL REY RD**  
**GLENWOOD SPRINGS, CO 81601**

**Site 2 of 2 in cluster F**

**LTANKS**  
**LUST**  
**UST**

**U003116754**  
**N/A**

**Relative:**  
**Lower**

LTANKS:  
Facility ID: 10965  
Name: WEST CARWASH  
Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
NFA Type: Tier I  
Status: Closed  
Event ID: 666  
Release Date: 06/20/1997  
Closed Date: 05/12/2006  
Contact: Winifred Bromley  
Phone: (303) 318-8547  
Email: cdle\_ops\_public\_record\_center@state.co.us  
Release Source: Tank  
Release Cause: Not reported  
Reimbursement Total: Not reported  
Release Number: REL-012735  
URL: https://socgov18.force.com/s/release/a183h000003KYZN

**LUST:**

Name: WEST CARWASH

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST CARWASH (Continued)**

**U003116754**

Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS, CO 81601  
Facility Id: 10965  
**Status: Closed**  
Event ID: 666  
Confirmed Release: 06/20/1997  
Contact Name: Technical Assistance Line  
Contact Phone: 303-318-8547  
Contact Email: Not reported  
Latitude Degrees: 39.562285  
Longitude Degrees: -107.361234

[Click here for COSTIS:](#)

**UST:**

Tank Tag: 10965-3  
Substance: GSLN  
Name: WEST CARWASH  
Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 10965-3  
Substance: GSLN  
Facility ID: 10965  
Owner Name: Gilco Inc  
Owner Address: PO Box 1061, Rifle, CO 81650  
Owner City: Rifle  
Owner State: CO  
Owner Zip: 81650  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 2000  
Date Closed: 07/31/1992  
Tank Status: Permanently Closed  
Date Tank Installed: 05/01/1970  
Tank Type: UST  
Latitude: 39.562285  
Longitude: -107.361234  
Tank Material: Asphalt Coated or Bare Steel  
Tank Wall Type: Not reported  
Piping Type: Other  
Piping System: Not reported  
Piping Material: Galvanized Steel  
Piping Wall Type: None  
Overfill Prevention: Not reported  
Tank ID: a1J3h000001jr43  
Account Name: ACCT-02597

Tank Tag: 10965-4  
Substance: GSLN  
Name: WEST CARWASH  
Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 10965-4  
Substance: GSLN  
Facility ID: 10965  
Owner Name: Gilco Inc  
Owner Address: PO Box 1061, Rifle, CO 81650



Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST CARWASH (Continued)**

**U003116754**

|                      |                              |
|----------------------|------------------------------|
| Owner City:          | Rifle                        |
| Owner State:         | CO                           |
| Owner Zip:           | 81650                        |
| Facility Type:       | Retail                       |
| Facility Category:   | Retail Gas Station           |
| Capacity:            | 2000                         |
| Date Closed:         | 07/31/1992                   |
| Tank Status:         | Permanently Closed           |
| Date Tank Installed: | 05/01/1970                   |
| Tank Type:           | UST                          |
| Latitude:            | 39.562285                    |
| Longitude:           | -107.361234                  |
| Tank Material:       | Asphalt Coated or Bare Steel |
| Tank Wall Type:      | Not reported                 |
| Piping Type:         | Other                        |
| Piping System:       | Not reported                 |
| Piping Material:     | Galvanized Steel             |
| Piping Wall Type:    | None                         |
| Overfill Prevention: | Not reported                 |
| Tank ID:             | a1J3h000001jr44              |
| Account Name:        | ACCT-02597                   |
| Tank Tag:            | 10965-2                      |
| Substance:           | GSLN                         |
| Name:                | WEST CARWASH                 |
| Address:             | 77 MEL REY RD                |
| City,State,Zip:      | GLENWOOD SPRINGS 81601       |
| Tank Tag:            | 10965-2                      |
| Substance:           | GSLN                         |
| Facility ID:         | 10965                        |
| Owner Name:          | Gilco Inc                    |
| Owner Address:       | PO Box 1061, Rifle, CO 81650 |
| Owner City:          | Rifle                        |
| Owner State:         | CO                           |
| Owner Zip:           | 81650                        |
| Facility Type:       | Retail                       |
| Facility Category:   | Retail Gas Station           |
| Capacity:            | 6000                         |
| Date Closed:         | 07/31/1992                   |
| Tank Status:         | Permanently Closed           |
| Date Tank Installed: | 05/01/1970                   |
| Tank Type:           | UST                          |
| Latitude:            | 39.562285                    |
| Longitude:           | -107.361234                  |
| Tank Material:       | Asphalt Coated or Bare Steel |
| Tank Wall Type:      | Not reported                 |
| Piping Type:         | Other                        |
| Piping System:       | Not reported                 |
| Piping Material:     | Galvanized Steel             |
| Piping Wall Type:    | None                         |
| Overfill Prevention: | Not reported                 |
| Tank ID:             | a1J3h000001jr42              |
| Account Name:        | ACCT-02597                   |
| Tank Tag:            | 10965-1                      |
| Substance:           | GSLN                         |
| Name:                | WEST CARWASH                 |

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST CARWASH (Continued)**

**U003116754**

Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 10965-1  
Substance: GSLN  
Facility ID: 10965  
Owner Name: Gilco Inc  
Owner Address: PO Box 1061, Rifle, CO 81650  
Owner City: Rifle  
Owner State: CO  
Owner Zip: 81650  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 6000  
Date Closed: 07/31/1992  
Tank Status: Permanently Closed  
Date Tank Installed: 05/01/1970  
Tank Type: UST  
Latitude: 39.562285  
Longitude: -107.361234  
Tank Material: Asphalt Coated or Bare Steel  
Tank Wall Type: Not reported  
Piping Type: Other  
Piping System: Not reported  
Piping Material: Galvanized Steel  
Piping Wall Type: None  
Overfill Prevention: Not reported  
Tank ID: a1J3h000001jr41  
Account Name: ACCT-02597

Tank Tag: 10965-5  
Substance: GSLN  
Name: WEST CARWASH  
Address: 77 MEL REY RD  
City,State,Zip: GLENWOOD SPRINGS 81601  
Tank Tag: 10965-5  
Substance: GSLN  
Facility ID: 10965  
Owner Name: Gilco Inc  
Owner Address: PO Box 1061, Rifle, CO 81650  
Owner City: Rifle  
Owner State: CO  
Owner Zip: 81650  
Facility Type: Retail  
Facility Category: Retail Gas Station  
Capacity: 6000  
Date Closed: 01/01/1988  
Tank Status: Permanently Closed  
Date Tank Installed: 05/01/1970  
Tank Type: UST  
Latitude: 39.562285  
Longitude: -107.361234  
Tank Material: Asphalt Coated or Bare Steel  
Tank Wall Type: Not reported  
Piping Type: UG: Underground  
Piping System: Not reported  
Piping Material: Galvanized Steel  
Piping Wall Type: None

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

**WEST CARWASH (Continued)**

**U003116754**

Overfill Prevention:  
Tank ID:  
Account Name:

Not reported  
a1J3h000001jr45  
ACCT-02597

Count: 3 records.

ORPHAN SUMMARY

| City             | EDR ID     | Site Name                          | Site Address              | Zip   | Database(s) |
|------------------|------------|------------------------------------|---------------------------|-------|-------------|
| GLENWOOD SPRINGS | U004008612 | GLENWOOD SPRINGS SECTION HQ        | DEVEREUX RD & DEVEREUX LN | 81601 | LTANKS, UST |
| GLENWOOD SPRINGS | S127311334 | GLENWOOD MUNICIPAL OPERATIONS CENT | 2301 WULFSOHN RD          | 81601 | LTANKS      |
| GLENWOOD SPRINGS | A100209180 | GLENWOOD MUNICIPAL OPERATIONS CENT | 2301 WULFSOHN RD          | 81601 | AST         |

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

### STANDARD ENVIRONMENTAL RECORDS

#### ***Lists of Federal NPL (Superfund) sites***

##### **NPL: National Priority List**

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 02/29/2024  | Source: EPA                            |
| Date Data Arrived at EDR: 03/01/2024    | Telephone: N/A                         |
| Date Made Active in Reports: 03/27/2024 | Last EDR Contact: 05/01/2024           |
| Number of Days to Update: 26            | Next Scheduled EDR Contact: 07/08/2024 |
|                                         | Data Release Frequency: Quarterly      |

##### **NPL Site Boundaries**

###### **Sources:**

EPA's Environmental Photographic Interpretation Center (EPIC)  
Telephone: 202-564-7333

EPA Region 1  
Telephone 617-918-1143

EPA Region 6  
Telephone: 214-655-6659

EPA Region 3  
Telephone 215-814-5418

EPA Region 7  
Telephone: 913-551-7247

EPA Region 4  
Telephone 404-562-8033

EPA Region 8  
Telephone: 303-312-6774

EPA Region 5  
Telephone 312-886-6686

EPA Region 9  
Telephone: 415-947-4246

EPA Region 10  
Telephone 206-553-8665

##### **Proposed NPL: Proposed National Priority List Sites**

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 02/29/2024  | Source: EPA                            |
| Date Data Arrived at EDR: 03/01/2024    | Telephone: N/A                         |
| Date Made Active in Reports: 03/27/2024 | Last EDR Contact: 05/01/2024           |
| Number of Days to Update: 26            | Next Scheduled EDR Contact: 07/08/2024 |
|                                         | Data Release Frequency: Quarterly      |

##### **NPL LIENS: Federal Superfund Liens**

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/15/1991  
Date Data Arrived at EDR: 02/02/1994  
Date Made Active in Reports: 03/30/1994  
Number of Days to Update: 56

Source: EPA  
Telephone: 202-564-4267  
Last EDR Contact: 08/15/2011  
Next Scheduled EDR Contact: 11/28/2011  
Data Release Frequency: No Update Planned

### ***Lists of Federal Delisted NPL sites***

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 02/29/2024  
Date Data Arrived at EDR: 03/01/2024  
Date Made Active in Reports: 03/27/2024  
Number of Days to Update: 26

Source: EPA  
Telephone: N/A  
Last EDR Contact: 05/01/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Quarterly

### ***Lists of Federal sites subject to CERCLA removals and CERCLA orders***

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/20/2023  
Date Data Arrived at EDR: 12/20/2023  
Date Made Active in Reports: 01/24/2024  
Number of Days to Update: 35

Source: Environmental Protection Agency  
Telephone: 703-603-8704  
Last EDR Contact: 03/26/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly known as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/22/2024  
Date Data Arrived at EDR: 05/01/2024  
Date Made Active in Reports: 05/24/2024  
Number of Days to Update: 23

Source: EPA  
Telephone: 800-424-9346  
Last EDR Contact: 05/01/2024  
Next Scheduled EDR Contact: 07/22/2024  
Data Release Frequency: Quarterly

### ***Lists of Federal CERCLA sites with NFRAP***

SEMS-ARCHIVE: Superfund Enterprise Management System Archive



## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be potential NPL site.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 04/22/2024  | Source: EPA                            |
| Date Data Arrived at EDR: 05/01/2024    | Telephone: 800-424-9346                |
| Date Made Active in Reports: 05/24/2024 | Last EDR Contact: 05/01/2024           |
| Number of Days to Update: 23            | Next Scheduled EDR Contact: 07/22/2024 |
|                                         | Data Release Frequency: Quarterly      |

### ***Lists of Federal RCRA facilities undergoing Corrective Action***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 12/04/2023  | Source: EPA                            |
| Date Data Arrived at EDR: 12/06/2023    | Telephone: 800-424-9346                |
| Date Made Active in Reports: 12/12/2023 | Last EDR Contact: 03/19/2024           |
| Number of Days to Update: 6             | Next Scheduled EDR Contact: 07/01/2024 |
|                                         | Data Release Frequency: Quarterly      |

### ***Lists of Federal RCRA TSD facilities***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/04/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/06/2023    | Telephone: 303-312-6149                 |
| Date Made Active in Reports: 12/12/2023 | Last EDR Contact: 03/19/2024            |
| Number of Days to Update: 6             | Next Scheduled EDR Contact: 07/01/2024  |
|                                         | Data Release Frequency: Quarterly       |

### ***Lists of Federal RCRA generators***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/04/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/06/2023    | Telephone: 303-312-6149                 |
| Date Made Active in Reports: 12/12/2023 | Last EDR Contact: 03/19/2024            |
| Number of Days to Update: 6             | Next Scheduled EDR Contact: 07/01/2024  |
|                                         | Data Release Frequency: Quarterly       |

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/04/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/06/2023    | Telephone: 303-312-6149                 |
| Date Made Active in Reports: 12/12/2023 | Last EDR Contact: 03/19/2024            |
| Number of Days to Update: 6             | Next Scheduled EDR Contact: 07/01/2024  |
|                                         | Data Release Frequency: Quarterly       |

### RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/04/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/06/2023    | Telephone: 303-312-6149                 |
| Date Made Active in Reports: 12/12/2023 | Last EDR Contact: 03/19/2024            |
| Number of Days to Update: 6             | Next Scheduled EDR Contact: 07/01/2024  |
|                                         | Data Release Frequency: Quarterly       |

### ***Federal institutional controls / engineering controls registries***

#### LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 02/14/2024  | Source: Department of the Navy         |
| Date Data Arrived at EDR: 02/16/2024    | Telephone: 843-820-7326                |
| Date Made Active in Reports: 04/04/2024 | Last EDR Contact: 05/17/2024           |
| Number of Days to Update: 48            | Next Scheduled EDR Contact: 08/19/2024 |
|                                         | Data Release Frequency: Varies         |

#### US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 02/13/2024  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 02/21/2024    | Telephone: 703-603-0695                 |
| Date Made Active in Reports: 04/04/2024 | Last EDR Contact: 05/21/2024            |
| Number of Days to Update: 43            | Next Scheduled EDR Contact: 09/02/2024  |
|                                         | Data Release Frequency: Varies          |

#### US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 02/13/2024  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 02/21/2024    | Telephone: 703-603-0695                 |
| Date Made Active in Reports: 04/04/2024 | Last EDR Contact: 05/21/2024            |
| Number of Days to Update: 43            | Next Scheduled EDR Contact: 09/02/2024  |
|                                         | Data Release Frequency: Varies          |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ***Federal ERNS list***

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/12/2023

Date Data Arrived at EDR: 12/13/2023

Date Made Active in Reports: 02/28/2024

Number of Days to Update: 77

Source: National Response Center, United States Coast Guard

Telephone: 202-267-2180

Last EDR Contact: 03/19/2024

Next Scheduled EDR Contact: 07/01/2024

Data Release Frequency: Quarterly

## ***Lists of state- and tribal hazardous waste facilities***

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A

Date Data Arrived at EDR: N/A

Date Made Active in Reports: N/A

Number of Days to Update: N/A

Source: Department of Public Health & Environment

Telephone: 303-692-3300

Last EDR Contact: 05/09/2024

Next Scheduled EDR Contact: 08/19/2024

Data Release Frequency: N/A

## ***Lists of state and tribal landfills and solid waste disposal facilities***

SWF/LF: Solid Waste Sites & Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/16/2023

Date Data Arrived at EDR: 11/09/2023

Date Made Active in Reports: 02/07/2024

Number of Days to Update: 90

Source: Department of Public Health & Environment

Telephone: 303-692-3300

Last EDR Contact: 05/16/2024

Next Scheduled EDR Contact: 08/19/2024

Data Release Frequency: Varies

SHWF: Solid Waste Information System Listing

A listing from the Solid Waste Information System, which is used to help administer the various programs of our solid waste and materials management program. It includes a wide variety of types of facilities and sites, and includes information obtained over several decades and numerous legacy data systems.

Date of Government Version: 01/29/2024

Date Data Arrived at EDR: 01/31/2024

Date Made Active in Reports: 04/18/2024

Number of Days to Update: 78

Source: Department of Public Health & Environment

Telephone: 303-692-6349

Last EDR Contact: 05/09/2024

Next Scheduled EDR Contact: 08/12/2024

Data Release Frequency: Varies

## ***Lists of state and tribal leaking storage tanks***

LTANKS: Petroleum Release Events Listing

Active and Closed OPS Petroleum Release Events in Colorado. Includes the OPS Open Event locations, but also shows locations of closed events (releases that have been issued a No Further Action determination).

Date of Government Version: 02/01/2024

Date Data Arrived at EDR: 02/27/2024

Date Made Active in Reports: 05/14/2024

Number of Days to Update: 77

Source: Department of Labor & Employment

Telephone: 303-318-8525

Last EDR Contact: 05/29/2024

Next Scheduled EDR Contact: 09/09/2024

Data Release Frequency: Quarterly

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### LAST: Leaking Aboveground Storage Tank Listing

A listing of leaking aboveground storage tank sites. This list is no longer maintained. For current Leaking AST information, please see LTANKS.

Date of Government Version: 03/01/2018  
Date Data Arrived at EDR: 03/07/2018  
Date Made Active in Reports: 04/03/2018  
Number of Days to Update: 27

Source: Department of Labor & Employment  
Telephone: 303-318-8525  
Last EDR Contact: 05/31/2018  
Next Scheduled EDR Contact: 09/10/2018  
Data Release Frequency: No Update Planned

### LUST: Leaking Underground Storage Tank List

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/01/2018  
Date Data Arrived at EDR: 03/07/2018  
Date Made Active in Reports: 04/03/2018  
Number of Days to Update: 27

Source: Department of Labor and Employment, Oil Inspection Section  
Telephone: 303-318-8521  
Last EDR Contact: 03/07/2018  
Next Scheduled EDR Contact: 06/18/2018  
Data Release Frequency: Quarterly

### INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/25/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 1  
Telephone: 617-918-1313  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/25/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 4  
Telephone: 404-562-8677  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/25/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 8  
Telephone: 303-312-6271  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/25/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 7  
Telephone: 913-551-7003  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/25/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: Environmental Protection Agency  
Telephone: 415-972-3372  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 10/04/2023  | Source: EPA, Region 5                  |
| Date Data Arrived at EDR: 01/17/2024    | Telephone: 312-886-7439                |
| Date Made Active in Reports: 03/13/2024 | Last EDR Contact: 04/17/2024           |
| Number of Days to Update: 56            | Next Scheduled EDR Contact: 07/29/2024 |
|                                         | Data Release Frequency: Varies         |

### INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 10/25/2023  | Source: EPA Region 6                   |
| Date Data Arrived at EDR: 01/17/2024    | Telephone: 214-665-6597                |
| Date Made Active in Reports: 03/13/2024 | Last EDR Contact: 04/17/2024           |
| Number of Days to Update: 56            | Next Scheduled EDR Contact: 07/29/2024 |
|                                         | Data Release Frequency: Varies         |

### INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 10/25/2023  | Source: EPA Region 10                  |
| Date Data Arrived at EDR: 01/17/2024    | Telephone: 206-553-2857                |
| Date Made Active in Reports: 03/13/2024 | Last EDR Contact: 04/17/2024           |
| Number of Days to Update: 56            | Next Scheduled EDR Contact: 07/29/2024 |
|                                         | Data Release Frequency: Varies         |

### TRUST: Lust Trust Sites

Reimbursement application package. The 1989 Colorado General Assembly established Colorado's Petroleum Storage Tank Fund. The Fund reimburses eligible applicants for allowable costs incurred in cleaning up petroleum contamination from underground and aboveground petroleum storage tanks, as well as for third-party liability expenses. Remediation of contamination caused by railroad or aircraft fuel is not eligible for reimbursement. The Fund satisfies federal Environmental Protection Agency financial assurance requirements. Monies in the Fund come from various sources, predominantly the state environmental surcharge imposed on all petroleum products except railroad or aircraft fuel.

|                                         |                                                                    |
|-----------------------------------------|--------------------------------------------------------------------|
| Date of Government Version: 12/12/2023  | Source: Department of Labor and Employment, Oil Inspection Section |
| Date Data Arrived at EDR: 12/13/2023    | Telephone: 303-318-8521                                            |
| Date Made Active in Reports: 03/07/2024 | Last EDR Contact: 03/15/2024                                       |
| Number of Days to Update: 85            | Next Scheduled EDR Contact: 07/01/2024                             |
|                                         | Data Release Frequency: Varies                                     |

### ***Lists of state and tribal registered storage tanks***

#### FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 11/16/2023  | Source: FEMA                           |
| Date Data Arrived at EDR: 11/16/2023    | Telephone: 202-646-5797                |
| Date Made Active in Reports: 02/13/2024 | Last EDR Contact: 03/19/2024           |
| Number of Days to Update: 89            | Next Scheduled EDR Contact: 07/15/2024 |
|                                         | Data Release Frequency: Varies         |

#### UST: Underground Storage Tank Database

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

|                                         |                                                                    |
|-----------------------------------------|--------------------------------------------------------------------|
| Date of Government Version: 05/23/2024  | Source: Department of Labor and Employment, Oil Inspection Section |
| Date Data Arrived at EDR: 05/24/2024    | Telephone: 303-318-8521                                            |
| Date Made Active in Reports: 05/28/2024 | Last EDR Contact: 05/22/2024                                       |
| Number of Days to Update: 4             | Next Scheduled EDR Contact: 09/09/2024                             |
|                                         | Data Release Frequency: Quarterly                                  |

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### AST: Aboveground Tank List

Aboveground storage tank locations.

Date of Government Version: 05/23/2024  
Date Data Arrived at EDR: 05/24/2024  
Date Made Active in Reports: 05/28/2024  
Number of Days to Update: 4

Source: Department of Labor and Employment, Oil Inspection Section  
Telephone: 303-318-8521  
Last EDR Contact: 05/22/2024  
Next Scheduled EDR Contact: 09/09/2024  
Data Release Frequency: Semi-Annually

### INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/24/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 9  
Telephone: 415-972-3368  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/24/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 4  
Telephone: 404-562-9424  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 10/24/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 6  
Telephone: 214-665-7591  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/24/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 8  
Telephone: 303-312-6137  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 10/24/2023  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 56

Source: EPA Region 7  
Telephone: 913-551-7003  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies



## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 10/24/2023  | Source: EPA Region 10                  |
| Date Data Arrived at EDR: 01/17/2024    | Telephone: 206-553-2857                |
| Date Made Active in Reports: 03/13/2024 | Last EDR Contact: 04/17/2024           |
| Number of Days to Update: 56            | Next Scheduled EDR Contact: 07/29/2024 |
|                                         | Data Release Frequency: Varies         |

### INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 10/17/2023  | Source: EPA Region 5                   |
| Date Data Arrived at EDR: 01/17/2024    | Telephone: 312-886-6136                |
| Date Made Active in Reports: 03/13/2024 | Last EDR Contact: 04/17/2024           |
| Number of Days to Update: 56            | Next Scheduled EDR Contact: 07/29/2024 |
|                                         | Data Release Frequency: Varies         |

### INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 10/24/2023  | Source: EPA, Region 1                  |
| Date Data Arrived at EDR: 01/17/2024    | Telephone: 617-918-1313                |
| Date Made Active in Reports: 03/13/2024 | Last EDR Contact: 04/17/2024           |
| Number of Days to Update: 56            | Next Scheduled EDR Contact: 07/29/2024 |
|                                         | Data Release Frequency: Varies         |

### ***State and tribal institutional control / engineering control registries***

#### AUL: Environmental Real Covenants List

Senate Bill 01-145 gave authority to the Colorado Department of Public Health and Environment to approve requests to restrict the future use of a property using an enforceable agreement called an environmental covenant. When a contaminated site is not cleaned up completely, land use restrictions may be used to ensure that the selected cleanup remedy is adequately protective of human health and the environment.

|                                         |                                                   |
|-----------------------------------------|---------------------------------------------------|
| Date of Government Version: 01/23/2024  | Source: Department of Public Health & Environment |
| Date Data Arrived at EDR: 01/24/2024    | Telephone: 303-692-3331                           |
| Date Made Active in Reports: 04/05/2024 | Last EDR Contact: 04/19/2024                      |
| Number of Days to Update: 72            | Next Scheduled EDR Contact: 08/05/2024            |
|                                         | Data Release Frequency: Varies                    |

### ***Lists of state and tribal voluntary cleanup sites***

#### VCP: Voluntary Cleanup & Redevelopment Act Application Tracking Report

The Voluntary Cleanup and Redevelopment Act is intended to permit and encourage voluntary cleanups by providing a method to determine clean-up responsibilities in planning the reuse of property. The VCRA was intended for sites which were not covered by existing regulatory programs.

|                                         |                                                       |
|-----------------------------------------|-------------------------------------------------------|
| Date of Government Version: 03/27/2024  | Source: Department of Public Health and Environmental |
| Date Data Arrived at EDR: 03/27/2024    | Telephone: 303-692-3331                               |
| Date Made Active in Reports: 04/16/2024 | Last EDR Contact: 03/27/2024                          |
| Number of Days to Update: 20            | Next Scheduled EDR Contact: 07/15/2024                |
|                                         | Data Release Frequency: Semi-Annually                 |

#### INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/20/2008  
Date Data Arrived at EDR: 04/22/2008  
Date Made Active in Reports: 05/19/2008  
Number of Days to Update: 27

Source: EPA, Region 7  
Telephone: 913-551-7365  
Last EDR Contact: 07/08/2021  
Next Scheduled EDR Contact: 07/20/2009  
Data Release Frequency: Varies

### INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015  
Date Data Arrived at EDR: 09/29/2015  
Date Made Active in Reports: 02/18/2016  
Number of Days to Update: 142

Source: EPA, Region 1  
Telephone: 617-918-1102  
Last EDR Contact: 03/18/2024  
Next Scheduled EDR Contact: 07/01/2024  
Data Release Frequency: Varies

### ***Lists of state and tribal brownfield sites***

#### BROWNFIELDS: Brownfields Sites Listing Brownfields Sites Listing

Date of Government Version: 01/16/2024  
Date Data Arrived at EDR: 01/16/2024  
Date Made Active in Reports: 04/02/2024  
Number of Days to Update: 77

Source: Department of Public Health & Environment  
Telephone: 303-692-3331  
Last EDR Contact: 04/16/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### **ADDITIONAL ENVIRONMENTAL RECORDS**

#### ***Local Brownfield lists***

#### US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 03/11/2024  
Date Data Arrived at EDR: 03/12/2024  
Date Made Active in Reports: 05/10/2024  
Number of Days to Update: 59

Source: Environmental Protection Agency  
Telephone: 202-566-2777  
Last EDR Contact: 03/12/2024  
Next Scheduled EDR Contact: 06/24/2024  
Data Release Frequency: Semi-Annually

#### ***Local Lists of Landfill / Solid Waste Disposal Sites***

#### SWRCY: Registered Recyclers Listing

A listing of registered recycler locations in the state of Colorado.

Date of Government Version: 07/26/2023  
Date Data Arrived at EDR: 08/24/2023  
Date Made Active in Reports: 08/25/2023  
Number of Days to Update: 1

Source: Department of Public Health & Environment  
Telephone: 303-692-3337  
Last EDR Contact: 03/04/2024  
Next Scheduled EDR Contact: 06/17/2024  
Data Release Frequency: Semi-Annually

#### HISTORICAL LANDFILL: Historical Landfill List Abandoned/Inactive Landfills.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 01/31/1993  
Date Data Arrived at EDR: 04/24/1994  
Date Made Active in Reports: 05/30/1994  
Number of Days to Update: 36

Source: Department of Public Health & Environment  
Telephone: 303-692-3300  
Last EDR Contact: 09/05/1996  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998  
Date Data Arrived at EDR: 12/03/2007  
Date Made Active in Reports: 01/24/2008  
Number of Days to Update: 52

Source: Environmental Protection Agency  
Telephone: 703-308-8245  
Last EDR Contact: 04/22/2024  
Next Scheduled EDR Contact: 08/05/2024  
Data Release Frequency: Varies

### DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009  
Date Data Arrived at EDR: 05/07/2009  
Date Made Active in Reports: 09/21/2009  
Number of Days to Update: 137

Source: EPA, Region 9  
Telephone: 415-947-4219  
Last EDR Contact: 04/15/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: No Update Planned

### ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985  
Date Data Arrived at EDR: 08/09/2004  
Date Made Active in Reports: 09/17/2004  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: 800-424-9346  
Last EDR Contact: 06/09/2004  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014  
Date Data Arrived at EDR: 08/06/2014  
Date Made Active in Reports: 01/29/2015  
Number of Days to Update: 176

Source: Department of Health & Human Services, Indian Health Service  
Telephone: 301-443-1452  
Last EDR Contact: 04/19/2024  
Next Scheduled EDR Contact: 08/04/2024  
Data Release Frequency: Varies

### DENVER CO HISTORIC FILL: Denver City & County Historic Fill Areas

This dataset denotes the approximate locations of historical fill areas within the City and County of Denver (CCoD) and with within approximately three-quarters of a mile of the CCoD boundaries. The data is of a general nature and obtained from historic and current documents that may not be accurate or precise.

Date of Government Version: 12/17/2019  
Date Data Arrived at EDR: 01/07/2020  
Date Made Active in Reports: 03/13/2020  
Number of Days to Update: 66

Source: City & County of Denver  
Telephone: 720-913-5237  
Last EDR Contact: 04/04/2024  
Next Scheduled EDR Contact: 07/15/2024  
Data Release Frequency: No Update Planned

### **Local Lists of Hazardous waste / Contaminated Sites**

#### US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2023  
Date Data Arrived at EDR: 02/21/2024  
Date Made Active in Reports: 04/04/2024  
Number of Days to Update: 43

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 05/21/2024  
Next Scheduled EDR Contact: 09/02/2024  
Data Release Frequency: No Update Planned

### CDL: Meth Lab Locations

Meth lab locations that were reported to the Department of Public Health & Environment.

Date of Government Version: 12/18/2023  
Date Data Arrived at EDR: 12/21/2023  
Date Made Active in Reports: 03/18/2024  
Number of Days to Update: 88

Source: Department of Public Health and Environment  
Telephone: 303-692-3023  
Last EDR Contact: 03/22/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Quarterly

### US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/31/2023  
Date Data Arrived at EDR: 02/21/2024  
Date Made Active in Reports: 04/04/2024  
Number of Days to Update: 43

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 05/21/2024  
Next Scheduled EDR Contact: 09/02/2024  
Data Release Frequency: Quarterly

### Local Land Records

#### LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/29/2024  
Date Data Arrived at EDR: 03/01/2024  
Date Made Active in Reports: 03/27/2024  
Number of Days to Update: 26

Source: Environmental Protection Agency  
Telephone: 202-564-6023  
Last EDR Contact: 05/01/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Semi-Annually

### Records of Emergency Release Reports

#### HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/12/2023  
Date Data Arrived at EDR: 12/13/2023  
Date Made Active in Reports: 02/28/2024  
Number of Days to Update: 77

Source: U.S. Department of Transportation  
Telephone: 202-366-4555  
Last EDR Contact: 03/20/2024  
Next Scheduled EDR Contact: 07/01/2024  
Data Release Frequency: Quarterly

#### CO ERNS: Spills Database

State reported spills.

Date of Government Version: 12/18/2023  
Date Data Arrived at EDR: 12/21/2023  
Date Made Active in Reports: 03/18/2024  
Number of Days to Update: 88

Source: Department of Public Health and Environmental  
Telephone: 303-692-2000  
Last EDR Contact: 03/22/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Quarterly

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### SPILLS 2: Spills

A listing of spills reported to the Oil & Gas Conservation Commission

Date of Government Version: 12/07/2023  
Date Data Arrived at EDR: 12/13/2023  
Date Made Active in Reports: 03/07/2024  
Number of Days to Update: 85

Source: Oil & Gas Conservation Commission  
Telephone: 303-894-2100  
Last EDR Contact: 03/19/2024  
Next Scheduled EDR Contact: 07/01/2024  
Data Release Frequency: Quarterly

### SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 10/15/2012  
Date Data Arrived at EDR: 01/03/2013  
Date Made Active in Reports: 02/06/2013  
Number of Days to Update: 34

Source: FirstSearch  
Telephone: N/A  
Last EDR Contact: 01/03/2013  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### Other Ascertainable Records

#### RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/04/2023  
Date Data Arrived at EDR: 12/06/2023  
Date Made Active in Reports: 12/12/2023  
Number of Days to Update: 6

Source: Environmental Protection Agency  
Telephone: 303-312-6149  
Last EDR Contact: 03/19/2024  
Next Scheduled EDR Contact: 07/01/2024  
Data Release Frequency: Quarterly

#### FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/30/2024  
Date Data Arrived at EDR: 02/13/2024  
Date Made Active in Reports: 04/04/2024  
Number of Days to Update: 51

Source: U.S. Army Corps of Engineers  
Telephone: 202-528-4285  
Last EDR Contact: 05/14/2024  
Next Scheduled EDR Contact: 08/26/2024  
Data Release Frequency: Varies

#### DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021  
Date Data Arrived at EDR: 07/13/2021  
Date Made Active in Reports: 03/09/2022  
Number of Days to Update: 239

Source: USGS  
Telephone: 888-275-8747  
Last EDR Contact: 04/11/2024  
Next Scheduled EDR Contact: 07/22/2024  
Data Release Frequency: Varies

#### FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/02/2018  
Date Data Arrived at EDR: 04/11/2018  
Date Made Active in Reports: 11/06/2019  
Number of Days to Update: 574

Source: U.S. Geological Survey  
Telephone: 888-275-8747  
Last EDR Contact: 04/04/2024  
Next Scheduled EDR Contact: 07/15/2024  
Data Release Frequency: N/A

### SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021  
Date Data Arrived at EDR: 02/03/2023  
Date Made Active in Reports: 02/10/2023  
Number of Days to Update: 7

Source: Environmental Protection Agency  
Telephone: 615-532-8599  
Last EDR Contact: 05/09/2024  
Next Scheduled EDR Contact: 08/19/2024  
Data Release Frequency: Varies

### US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/11/2023  
Date Data Arrived at EDR: 12/13/2023  
Date Made Active in Reports: 02/28/2024  
Number of Days to Update: 77

Source: Environmental Protection Agency  
Telephone: 202-566-1917  
Last EDR Contact: 03/13/2024  
Next Scheduled EDR Contact: 07/01/2024  
Data Release Frequency: Quarterly

### EPA WATCH LIST: EPA Watch List

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013  
Date Data Arrived at EDR: 03/21/2014  
Date Made Active in Reports: 06/17/2014  
Number of Days to Update: 88

Source: Environmental Protection Agency  
Telephone: 617-520-3000  
Last EDR Contact: 04/29/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: No Update Planned

### 2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017  
Date Data Arrived at EDR: 05/08/2018  
Date Made Active in Reports: 07/20/2018  
Number of Days to Update: 73

Source: Environmental Protection Agency  
Telephone: 703-308-4044  
Last EDR Contact: 05/02/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: Varies

### TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.



## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2020  
Date Data Arrived at EDR: 06/14/2022  
Date Made Active in Reports: 03/24/2023  
Number of Days to Update: 283

Source: EPA  
Telephone: 202-260-5521  
Last EDR Contact: 03/14/2024  
Next Scheduled EDR Contact: 06/24/2024  
Data Release Frequency: Every 4 Years

### TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2022  
Date Data Arrived at EDR: 11/13/2023  
Date Made Active in Reports: 02/07/2024  
Number of Days to Update: 86

Source: EPA  
Telephone: 202-566-0250  
Last EDR Contact: 05/16/2024  
Next Scheduled EDR Contact: 08/26/2024  
Data Release Frequency: Annually

### SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 01/16/2024  
Date Data Arrived at EDR: 01/17/2024  
Date Made Active in Reports: 03/27/2024  
Number of Days to Update: 70

Source: EPA  
Telephone: 202-564-4203  
Last EDR Contact: 04/17/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Annually

### ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/29/2024  
Date Data Arrived at EDR: 03/01/2024  
Date Made Active in Reports: 03/27/2024  
Number of Days to Update: 26

Source: EPA  
Telephone: 703-416-0223  
Last EDR Contact: 05/01/2024  
Next Scheduled EDR Contact: 06/10/2024  
Data Release Frequency: Annually

### RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 02/01/2024  
Date Data Arrived at EDR: 02/08/2024  
Date Made Active in Reports: 04/04/2024  
Number of Days to Update: 56

Source: Environmental Protection Agency  
Telephone: 202-564-8600  
Last EDR Contact: 04/15/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Varies

### RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/17/1995  
Date Data Arrived at EDR: 07/03/1995  
Date Made Active in Reports: 08/07/1995  
Number of Days to Update: 35

Source: EPA  
Telephone: 202-564-4104  
Last EDR Contact: 06/02/2008  
Next Scheduled EDR Contact: 09/01/2008  
Data Release Frequency: No Update Planned

### PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 09/19/2023  
Date Data Arrived at EDR: 10/03/2023  
Date Made Active in Reports: 10/19/2023  
Number of Days to Update: 16

Source: EPA  
Telephone: 202-564-6023  
Last EDR Contact: 05/01/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: Quarterly

### PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2023  
Date Data Arrived at EDR: 04/04/2023  
Date Made Active in Reports: 06/09/2023  
Number of Days to Update: 66

Source: EPA  
Telephone: 202-566-0500  
Last EDR Contact: 04/04/2024  
Next Scheduled EDR Contact: 07/15/2024  
Data Release Frequency: Annually

### ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016  
Date Data Arrived at EDR: 11/23/2016  
Date Made Active in Reports: 02/10/2017  
Number of Days to Update: 79

Source: Environmental Protection Agency  
Telephone: 202-564-2501  
Last EDR Contact: 03/28/2024  
Next Scheduled EDR Contact: 07/15/2024  
Data Release Frequency: Quarterly

### FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009  
Date Data Arrived at EDR: 04/16/2009  
Date Made Active in Reports: 05/11/2009  
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances  
Telephone: 202-566-1667  
Last EDR Contact: 08/18/2017  
Next Scheduled EDR Contact: 12/04/2017  
Data Release Frequency: No Update Planned

### FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009  
Date Data Arrived at EDR: 04/16/2009  
Date Made Active in Reports: 05/11/2009  
Number of Days to Update: 25

Source: EPA  
Telephone: 202-566-1667  
Last EDR Contact: 08/18/2017  
Next Scheduled EDR Contact: 12/04/2017  
Data Release Frequency: No Update Planned

### MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 01/02/2024  
Date Data Arrived at EDR: 01/16/2024  
Date Made Active in Reports: 03/13/2024  
Number of Days to Update: 57

Source: Nuclear Regulatory Commission  
Telephone: 301-415-0717  
Last EDR Contact: 04/15/2024  
Next Scheduled EDR Contact: 07/29/2024  
Data Release Frequency: Quarterly

### COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2022  
Date Data Arrived at EDR: 11/27/2023  
Date Made Active in Reports: 02/22/2024  
Number of Days to Update: 87

Source: Department of Energy  
Telephone: 202-586-8719  
Last EDR Contact: 05/28/2024  
Next Scheduled EDR Contact: 09/09/2024  
Data Release Frequency: Varies

### COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017  
Date Data Arrived at EDR: 03/05/2019  
Date Made Active in Reports: 11/11/2019  
Number of Days to Update: 251

Source: Environmental Protection Agency  
Telephone: N/A  
Last EDR Contact: 05/28/2024  
Next Scheduled EDR Contact: 09/09/2024  
Data Release Frequency: Varies

### PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019  
Date Data Arrived at EDR: 11/06/2019  
Date Made Active in Reports: 02/10/2020  
Number of Days to Update: 96

Source: Environmental Protection Agency  
Telephone: 202-566-0517  
Last EDR Contact: 05/02/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: Varies

### RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019  
Date Data Arrived at EDR: 07/01/2019  
Date Made Active in Reports: 09/23/2019  
Number of Days to Update: 84

Source: Environmental Protection Agency  
Telephone: 202-343-9775  
Last EDR Contact: 03/25/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Quarterly

### HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006  
Date Data Arrived at EDR: 03/01/2007  
Date Made Active in Reports: 04/10/2007  
Number of Days to Update: 40

Source: Environmental Protection Agency  
Telephone: 202-564-2501  
Last EDR Contact: 12/17/2007  
Next Scheduled EDR Contact: 03/17/2008  
Data Release Frequency: No Update Planned

### HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/19/2006  
Date Data Arrived at EDR: 03/01/2007  
Date Made Active in Reports: 04/10/2007  
Number of Days to Update: 40

Source: Environmental Protection Agency  
Telephone: 202-564-2501  
Last EDR Contact: 12/17/2008  
Next Scheduled EDR Contact: 03/17/2008  
Data Release Frequency: No Update Planned

### DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020  
Date Data Arrived at EDR: 01/28/2020  
Date Made Active in Reports: 04/17/2020  
Number of Days to Update: 80

Source: Department of Transportation, Office of Pipeline Safety  
Telephone: 202-366-4595  
Last EDR Contact: 04/23/2024  
Next Scheduled EDR Contact: 08/05/2024  
Data Release Frequency: Quarterly

### CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2023  
Date Data Arrived at EDR: 01/11/2024  
Date Made Active in Reports: 01/16/2024  
Number of Days to Update: 5

Source: Department of Justice, Consent Decree Library  
Telephone: Varies  
Last EDR Contact: 03/28/2024  
Next Scheduled EDR Contact: 07/15/2024  
Data Release Frequency: Varies

### BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021  
Date Data Arrived at EDR: 03/09/2023  
Date Made Active in Reports: 03/20/2023  
Number of Days to Update: 11

Source: EPA/NTIS  
Telephone: 800-424-9346  
Last EDR Contact: 03/19/2024  
Next Scheduled EDR Contact: 07/01/2024  
Data Release Frequency: Biennially

### INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014  
Date Data Arrived at EDR: 07/14/2015  
Date Made Active in Reports: 01/10/2017  
Number of Days to Update: 546

Source: USGS  
Telephone: 202-208-3710  
Last EDR Contact: 04/04/2024  
Next Scheduled EDR Contact: 07/15/2024  
Data Release Frequency: Semi-Annually

### FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023  
Date Data Arrived at EDR: 03/03/2023  
Date Made Active in Reports: 06/09/2023  
Number of Days to Update: 98

Source: Department of Energy  
Telephone: 202-586-3559  
Last EDR Contact: 04/26/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: Varies

### UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/30/2019  
Date Data Arrived at EDR: 11/15/2019  
Date Made Active in Reports: 01/28/2020  
Number of Days to Update: 74

Source: Department of Energy  
Telephone: 505-845-0011  
Last EDR Contact: 05/16/2024  
Next Scheduled EDR Contact: 08/26/2024  
Data Release Frequency: Varies

### LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 02/29/2024  
Date Data Arrived at EDR: 03/01/2024  
Date Made Active in Reports: 03/27/2024  
Number of Days to Update: 26

Source: Environmental Protection Agency  
Telephone: 703-603-8787  
Last EDR Contact: 05/01/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Varies

### LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001  
Date Data Arrived at EDR: 10/27/2010  
Date Made Active in Reports: 12/02/2010  
Number of Days to Update: 36

Source: American Journal of Public Health  
Telephone: 703-305-6451  
Last EDR Contact: 12/02/2009  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016  
Date Data Arrived at EDR: 10/26/2016  
Date Made Active in Reports: 02/03/2017  
Number of Days to Update: 100

Source: EPA  
Telephone: 202-564-2496  
Last EDR Contact: 09/26/2017  
Next Scheduled EDR Contact: 01/08/2018  
Data Release Frequency: Annually

### US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016  
Date Data Arrived at EDR: 10/26/2016  
Date Made Active in Reports: 02/03/2017  
Number of Days to Update: 100

Source: EPA  
Telephone: 202-564-2496  
Last EDR Contact: 09/26/2017  
Next Scheduled EDR Contact: 01/08/2018  
Data Release Frequency: Annually

### MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 01/02/2024  
Date Data Arrived at EDR: 01/03/2024  
Date Made Active in Reports: 01/04/2024  
Number of Days to Update: 1

Source: DOL, Mine Safety & Health Admini  
Telephone: 202-693-9424  
Last EDR Contact: 04/04/2024  
Next Scheduled EDR Contact: 09/02/2024  
Data Release Frequency: Quarterly

### US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/05/2024  
Date Data Arrived at EDR: 02/21/2024  
Date Made Active in Reports: 04/04/2024  
Number of Days to Update: 43

Source: Department of Labor, Mine Safety and Health Administration  
Telephone: 303-231-5959  
Last EDR Contact: 05/21/2024  
Next Scheduled EDR Contact: 09/02/2024  
Data Release Frequency: Semi-Annually

### US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 01/07/2022  
Date Data Arrived at EDR: 02/24/2023  
Date Made Active in Reports: 05/17/2023  
Number of Days to Update: 82

Source: USGS  
Telephone: 703-648-7709  
Last EDR Contact: 05/22/2024  
Next Scheduled EDR Contact: 09/02/2024  
Data Release Frequency: Varies

### US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011  
Date Data Arrived at EDR: 06/08/2011  
Date Made Active in Reports: 09/13/2011  
Number of Days to Update: 97

Source: USGS  
Telephone: 703-648-7709  
Last EDR Contact: 05/23/2024  
Next Scheduled EDR Contact: 09/02/2024  
Data Release Frequency: Varies

### MINES MRDS: Mineral Resources Data System Mineral Resources Data System

Date of Government Version: 08/23/2022  
Date Data Arrived at EDR: 11/22/2022  
Date Made Active in Reports: 02/28/2023  
Number of Days to Update: 98

Source: USGS  
Telephone: 703-648-6533  
Last EDR Contact: 05/22/2024  
Next Scheduled EDR Contact: 09/02/2024  
Data Release Frequency: Varies

### ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 11/28/2023  
Date Data Arrived at EDR: 11/29/2023  
Date Made Active in Reports: 12/11/2023  
Number of Days to Update: 12

Source: Department of Interior  
Telephone: 202-208-2609  
Last EDR Contact: 03/15/2024  
Next Scheduled EDR Contact: 06/17/2024  
Data Release Frequency: Quarterly

### FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/09/2024  
Date Data Arrived at EDR: 02/27/2024  
Date Made Active in Reports: 05/24/2024  
Number of Days to Update: 87

Source: EPA  
Telephone: (303) 312-6312  
Last EDR Contact: 05/29/2024  
Next Scheduled EDR Contact: 09/09/2024  
Data Release Frequency: Quarterly



## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/17/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-564-2280                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/04/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Quarterly       |

### DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 05/06/2021  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 05/21/2021    | Telephone: 202-564-0527                 |
| Date Made Active in Reports: 08/11/2021 | Last EDR Contact: 05/17/2024            |
| Number of Days to Update: 82            | Next Scheduled EDR Contact: 09/02/2024  |
|                                         | Data Release Frequency: Varies          |

### UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 09/06/2023  | Source: Department of Defense          |
| Date Data Arrived at EDR: 09/13/2023    | Telephone: 703-704-1564                |
| Date Made Active in Reports: 12/11/2023 | Last EDR Contact: 04/08/2024           |
| Number of Days to Update: 89            | Next Scheduled EDR Contact: 07/22/2024 |
|                                         | Data Release Frequency: Varies         |

### FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 02/12/2024  | Source: EPA                            |
| Date Data Arrived at EDR: 02/13/2024    | Telephone: 800-385-6164                |
| Date Made Active in Reports: 04/04/2024 | Last EDR Contact: 05/14/2024           |
| Number of Days to Update: 51            | Next Scheduled EDR Contact: 08/26/2024 |
|                                         | Data Release Frequency: Quarterly      |

### PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 703-603-8895                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### PFAS TRIS: List of PFAS Added to the TRI

Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-566-0250                 |
| Date Made Active in Reports: 01/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 7             | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 01/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 7             | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST\_HANDLING\_INSTR), Non-hazardous waste description (NON\_HAZ\_WASTE\_DESCRIPTION), DOT printed information (DOT\_PRINTED\_INFORMATION), Waste line handling instructions (WASTE\_LINE\_HANDLING\_INSTR), Waste residue comments (WASTE\_RESIDUE\_COMMENTS).

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 01/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 7             | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

|                                         |                                               |
|-----------------------------------------|-----------------------------------------------|
| Date of Government Version: 06/24/2020  | Source: Department of Health & Human Services |
| Date Data Arrived at EDR: 03/17/2021    | Telephone: 202-741-5770                       |
| Date Made Active in Reports: 11/08/2022 | Last EDR Contact: 04/22/2024                  |
| Number of Days to Update: 601           | Next Scheduled EDR Contact: 08/05/2024        |
|                                         | Data Release Frequency: Varies                |

### PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS ECHO FIRE TRAINING: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facility's name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS PART 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration's document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-272-0167                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/28/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 12/28/2023    | Telephone: 202-267-2675                 |
| Date Made Active in Reports: 03/04/2024 | Last EDR Contact: 04/05/2024            |
| Number of Days to Update: 67            | Next Scheduled EDR Contact: 07/15/2024  |
|                                         | Data Release Frequency: Varies          |

### PCS ENF: Enforcement data

No description is available for this data

|                                         |                                        |
|-----------------------------------------|----------------------------------------|
| Date of Government Version: 12/31/2014  | Source: EPA                            |
| Date Data Arrived at EDR: 02/05/2015    | Telephone: 202-564-2497                |
| Date Made Active in Reports: 03/06/2015 | Last EDR Contact: 03/29/2024           |
| Number of Days to Update: 29            | Next Scheduled EDR Contact: 07/15/2024 |
|                                         | Data Release Frequency: Varies         |

### PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

|                                         |                                           |
|-----------------------------------------|-------------------------------------------|
| Date of Government Version: 12/16/2016  | Source: EPA, Office of Water              |
| Date Data Arrived at EDR: 01/06/2017    | Telephone: 202-564-2496                   |
| Date Made Active in Reports: 03/10/2017 | Last EDR Contact: 03/29/2024              |
| Number of Days to Update: 63            | Next Scheduled EDR Contact: 07/15/2024    |
|                                         | Data Release Frequency: No Update Planned |

### BIOSOLIDS: ICIS-NPDES Biosolids Facility Data

The data reflects compliance information about facilities in the biosolids program.

|                                         |                                         |
|-----------------------------------------|-----------------------------------------|
| Date of Government Version: 12/31/2023  | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 01/03/2024    | Telephone: 202-564-4700                 |
| Date Made Active in Reports: 01/16/2024 | Last EDR Contact: 04/16/2024            |
| Number of Days to Update: 13            | Next Scheduled EDR Contact: 07/29/2024  |
|                                         | Data Release Frequency: Varies          |

### PFAS: PFAS Information Listing

A list of entities that have tested groundwater and have found PFAS chemicals, specifically PFOA and PFOS, levels above the health advisory. Potential sources of these chemicals include military bases, fire stations or training centers, landfills, industrial sites, car racetracks, and ski resorts.

|                                         |                                                   |
|-----------------------------------------|---------------------------------------------------|
| Date of Government Version: 01/19/2024  | Source: Department of Public Health & Environment |
| Date Data Arrived at EDR: 01/19/2024    | Telephone: 303-692-3605                           |
| Date Made Active in Reports: 04/08/2024 | Last EDR Contact: 04/15/2024                      |
| Number of Days to Update: 80            | Next Scheduled EDR Contact: 07/15/2024            |
|                                         | Data Release Frequency: Varies                    |

### AQUEOUS FOAM: Class B Firefighting Foam Contaminating PFAS Listing

Class B foams put out fires caused by flammable liquids like gasoline, oil, and jet fuel. They may contain PFAS chemicals. Anyone using or storing Class B firefighting foam containing these chemicals must register through the Certificate of Registration Program.303-692-38

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 01/02/2024  
Date Data Arrived at EDR: 01/03/2024  
Date Made Active in Reports: 03/26/2024  
Number of Days to Update: 83

Source: Department of Public Health & Environment  
Telephone: 303-692-3605  
Last EDR Contact: 04/04/2024  
Next Scheduled EDR Contact: 07/15/2024  
Data Release Frequency: Varies

### AIRS: Permitted Facility & Emissions Listing

A listing of Air Pollution Control Division permits and emissions data.

Date of Government Version: 04/18/2024  
Date Data Arrived at EDR: 04/19/2024  
Date Made Active in Reports: 04/24/2024  
Number of Days to Update: 5

Source: Department of Public Health & Environment  
Telephone: 303-692-3213  
Last EDR Contact: 05/22/2024  
Next Scheduled EDR Contact: 09/09/2024  
Data Release Frequency: Varies

### ASBESTOS: Asbestos Abatement & Demolition Projects

Asbestos abatement and demolition projects by the contractor.

Date of Government Version: 11/06/2019  
Date Data Arrived at EDR: 01/09/2020  
Date Made Active in Reports: 03/16/2020  
Number of Days to Update: 67

Source: Department of Public Health & Environment  
Telephone: 303-692-3100  
Last EDR Contact: 04/25/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: Semi-Annually

### METHANE SITE: Methane Site Investigations - Jefferson County 1980

The objectives of the study are to define as closely as possible the boundaries of methane producing solid waste landfills.

Date of Government Version: 12/31/1980  
Date Data Arrived at EDR: 02/13/1995  
Date Made Active in Reports: 04/04/1995  
Number of Days to Update: 50

Source: Jefferson County Health Department  
Telephone: 303-239-7175  
Last EDR Contact: 01/27/1995  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### METHANE INVESTIGATION: Methane Gas & Swamp Findings

The primary objective of this study was to assess methane gas related hazards at selected landfill sites in Colorado. These sites were selected by the Colorado Department of Health following evaluation of responses received from County and Municipal agencies about completed and existing landfills within their jurisdiction.

Date of Government Version: 03/15/1979  
Date Data Arrived at EDR: 02/13/1995  
Date Made Active in Reports: 04/04/1995  
Number of Days to Update: 50

Source: Department of Health  
Telephone: 303-640-3335  
Last EDR Contact: 01/27/1995  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### DRYCLEANERS: Drycleaner Facilities

A listing of drycleaning facilities.

Date of Government Version: 04/18/2024  
Date Data Arrived at EDR: 04/19/2024  
Date Made Active in Reports: 04/24/2024  
Number of Days to Update: 5

Source: Department of Public Health & Environment  
Telephone: 303-692-3213  
Last EDR Contact: 05/22/2024  
Next Scheduled EDR Contact: 09/09/2024  
Data Release Frequency: Varies

### FIN ASSURANCE 1: Financial Assurance Information Listing

A listing of financial assurance information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2023  
Date Data Arrived at EDR: 01/04/2024  
Date Made Active in Reports: 03/26/2024  
Number of Days to Update: 82

Source: Department of Public Health & Environment  
Telephone: 303-692-3350  
Last EDR Contact: 04/05/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Varies

### FIN ASSURANCE 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 12/31/2023  
Date Data Arrived at EDR: 01/04/2024  
Date Made Active in Reports: 03/26/2024  
Number of Days to Update: 82

Source: Department of Public Health & Environment  
Telephone: 303-392-3350  
Last EDR Contact: 04/05/2024  
Next Scheduled EDR Contact: 07/08/2024  
Data Release Frequency: Quarterly

### LEAD: Lead Abatement Permit Listing

Lead inspection

Date of Government Version: 11/07/2019  
Date Data Arrived at EDR: 11/14/2019  
Date Made Active in Reports: 01/21/2020  
Number of Days to Update: 68

Source: Department of Public Health & Environment  
Telephone: 303-692-2000  
Last EDR Contact: 04/25/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: Varies

### MINES: Permitted Mines Listing

This dataset represents permitted mines in the State of Colorado

Date of Government Version: 01/08/2024  
Date Data Arrived at EDR: 01/10/2024  
Date Made Active in Reports: 04/02/2024  
Number of Days to Update: 83

Source: Division of Reclamation Mining and safety  
Telephone: 303-866-3567  
Last EDR Contact: 04/09/2024  
Next Scheduled EDR Contact: 07/22/2024  
Data Release Frequency: Semi-Annually

### NPDES: Permitted Facility Listing

A listing of permitted facilities from the Water Quality Control Division.

Date of Government Version: 12/01/2023  
Date Data Arrived at EDR: 01/23/2024  
Date Made Active in Reports: 04/08/2024  
Number of Days to Update: 76

Source: Department of Public Health & Environment  
Telephone: 303-692-3611  
Last EDR Contact: 04/23/2024  
Next Scheduled EDR Contact: 08/05/2024  
Data Release Frequency: Varies

### UIC: Underground Injection Control

A list of underground injection wells and their locations.

Date of Government Version: 02/05/2024  
Date Data Arrived at EDR: 02/06/2024  
Date Made Active in Reports: 02/27/2024  
Number of Days to Update: 21

Source: Oil & Gas Conservation Commission  
Telephone: 303-894-2100  
Last EDR Contact: 05/02/2024  
Next Scheduled EDR Contact: 08/19/2024  
Data Release Frequency: Varies

### UMTRA: Uranium Mill Tailings Sites

There were nine uranium mill tailings sites in Colorado designated for cleanup under the federal Uranium Mill Tailings Radiation Control Act. These nine sites, know commonly as UMTRA sites, were remediated jointly by the State of Colorado and the U.S. Department of Energy during the late 1980's and early 1990's. Mill tailings were removed from 8 of the mill sites and relocated in engineered disposal cells. A disposal cell is designed to encapsulate the material, reduce radon emanation, and prevent the movement of water through the material. At one site, Maybell, CO, the tailings were stabilized in-place at the mill site. After remediation of the tailings was completed, the State and DOE began to investigate the residual impacts to groundwater at the mill sites. The groundwater phase of the UMTRA program is on-going.



## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 11/14/2022  
Date Data Arrived at EDR: 02/14/2023  
Date Made Active in Reports: 02/15/2023  
Number of Days to Update: 1

Source: Department of Public Health & Environment  
Telephone: 970-248-7164  
Last EDR Contact: 05/16/2024  
Next Scheduled EDR Contact: 08/26/2024  
Data Release Frequency: Varies

### UST FINDER RELEASE: UST Finder Releases Database

US EPA's UST Finder data is a national composite of leaking underground storage tanks. This data contains information about, and locations of, leaking underground storage tanks. Data was collected from state sources and standardized into a national profile by EPA's Office of Underground Storage Tanks, Office of Research and Development, and the Association of State and Territorial Solid Waste Management Officials.

Date of Government Version: 06/08/2023  
Date Data Arrived at EDR: 10/31/2023  
Date Made Active in Reports: 01/18/2024  
Number of Days to Update: 79

Source: Environmental Protection Agency  
Telephone: 202-564-0394  
Last EDR Contact: 05/08/2024  
Next Scheduled EDR Contact: 08/19/2024  
Data Release Frequency: Semi-Annually

### UST FINDER: UST Finder Database

EPA developed UST Finder, a web map application containing a comprehensive, state-sourced national map of underground storage tank (UST) and leaking UST (LUST) data. It provides the attributes and locations of active and closed USTs, UST facilities, and LUST sites from states and from Tribal lands and US territories. UST Finder contains information about proximity of UST facilities and LUST sites to: surface and groundwater public drinking water protection areas; estimated number of private domestic wells and number of people living nearby; and flooding and wildfires.

Date of Government Version: 06/08/2023  
Date Data Arrived at EDR: 10/04/2023  
Date Made Active in Reports: 01/18/2024  
Number of Days to Update: 106

Source: Environmental Protection Agency  
Telephone: 202-564-0394  
Last EDR Contact: 05/08/2024  
Next Scheduled EDR Contact: 08/19/2024  
Data Release Frequency: Varies

### EDR HIGH RISK HISTORICAL RECORDS

#### ***EDR Exclusive Records***

#### EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

#### EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

### EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

### EDR RECOVERED GOVERNMENT ARCHIVES

#### ***Exclusive Recovered Govt. Archives***

#### RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Public Health & Environment in Colorado.

Date of Government Version: N/A  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 01/15/2014  
Number of Days to Update: 198

Source: Department of Public Health & Environment  
Telephone: N/A  
Last EDR Contact: 06/01/2012  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

#### RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Labor and Employment, Oil Inspection Section in Colorado.

Date of Government Version: N/A  
Date Data Arrived at EDR: 07/01/2013  
Date Made Active in Reports: 01/02/2014  
Number of Days to Update: 185

Source: Department of Labor and Employment, Oil Inspection Section  
Telephone: N/A  
Last EDR Contact: 06/01/2012  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

### COUNTY RECORDS

#### ADAMS COUNTY:

LF ADAMS: Summary Report on Methane Gas Hazards and Surveys Conducted on Domestic and Demolition Landfills in Adams County  
As of May 8, 1978, all known landfills or dumping sites in the Adams County area have been surveyed.

Date of Government Version: 05/08/1978  
Date Data Arrived at EDR: 02/16/1995  
Date Made Active in Reports: 04/04/1995  
Number of Days to Update: 47

Source: Tri-County Health Department  
Telephone: 303-761-1340  
Last EDR Contact: 01/27/1995  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

#### ARAPAHOE COUNTY:

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### LF ARAPAHOE: A Survey of Landfills in Arapahoe County

A survey of Arapahoe County was conducted from August through November, 1977, of all open and closed landfills and dumpsites in the county. Each of the sites found was classified as domestic or demolition.

Date of Government Version: 12/31/1978  
Date Data Arrived at EDR: 02/16/1995  
Date Made Active in Reports: 04/04/1995  
Number of Days to Update: 47

Source: Tri-County Health Department  
Telephone: 303-761-1340  
Last EDR Contact: 01/27/1995  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### BOULDER COUNTY:

#### LF BOULDER: Old Landfill Sites

Landfill sites in Boulder county.

Date of Government Version: 05/01/1986  
Date Data Arrived at EDR: 11/14/1995  
Date Made Active in Reports: 12/07/1995  
Number of Days to Update: 23

Source: Boulder County Health Department  
Telephone: 303-441-1182  
Last EDR Contact: 01/30/1998  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### DENVER COUNTY:

#### LF DENVER: Landfills in Denver County

Landfill sites in the city and county of Denver.

Date of Government Version: 06/23/2017  
Date Data Arrived at EDR: 06/23/2017  
Date Made Active in Reports: 09/06/2017  
Number of Days to Update: 75

Source: City and County of Denver  
Telephone: 720-913-4839  
Last EDR Contact: 03/12/2024  
Next Scheduled EDR Contact: 06/24/2024  
Data Release Frequency: No Update Planned

#### LF DENVER CO METHANE: Investigation of Methane Gas Hazards

The purpose of this study was to assess the actual and potential generation, migration, explosive and related problem associated with specified old landfills, and to identify existing and potential problems, suggested strategies to prevent, abate, and control such problems and recommend investigative and monitoring functions as may be deemed necessary. Eight sites determined to be priorities due to population density and potential hazards to population and property were selected by the Colorado Department of Health.

Date of Government Version: 01/01/1981  
Date Data Arrived at EDR: 01/29/2013  
Date Made Active in Reports: 03/08/2013  
Number of Days to Update: 38

Source: City and County of Denver Department of Environmental Health  
Telephone: 720-865-5522  
Last EDR Contact: 01/15/2013  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### DOUGLAS COUNTY:

#### LF DOUGLAS: Douglas County Landfill Key

Landfill sites in Douglas county.

Date of Government Version: 06/12/1991  
Date Data Arrived at EDR: 02/16/1995  
Date Made Active in Reports: 04/04/1995  
Number of Days to Update: 47

Source: Tri-County Health Department  
Telephone: 303-761-1340  
Last EDR Contact: 01/27/1995  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### PUEBLO COUNTY:

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### LF PUEBLO: Designated Disposal & Landfill Sites

Only inert materials. Asphalt, cement, dirt & rock unless otherwise specified. These sites are no longer active.

Date of Government Version: 04/30/1990  
Date Data Arrived at EDR: 11/16/1995  
Date Made Active in Reports: 12/07/1995  
Number of Days to Update: 21

Source: Pueblo City-County Health Department  
Telephone: 719-583-4300  
Last EDR Contact: 11/13/1995  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### TRI COUNTY:

#### LF TRI: Tri-County Area Solid Waste Facilities List (Adams, Arapahoe and Douglas Counties)

Closed Domestic Landfills in Adams County, Closed Domestic Landfills in Arapahoe County, Closed Demolition Landfills in Arapahoe County, Closed Domestic Landfills in Douglas County.

Date of Government Version: 10/15/1983  
Date Data Arrived at EDR: 02/16/1995  
Date Made Active in Reports: 04/04/1995  
Number of Days to Update: 47

Source: Tri-County Health Department  
Telephone: 303-761-1340  
Last EDR Contact: 01/27/1995  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

### WELD COUNTY:

#### LF WELD: Solid Waste Facilities in Weld County Solid Waste Facilities in Weld County.

Date of Government Version: 01/16/2018  
Date Data Arrived at EDR: 02/09/2018  
Date Made Active in Reports: 02/23/2018  
Number of Days to Update: 14

Source: Weld County Department of Public Health  
Telephone: 970-304-6415  
Last EDR Contact: 05/02/2024  
Next Scheduled EDR Contact: 08/12/2024  
Data Release Frequency: No Update Planned

### OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

#### CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 02/05/2024  
Date Data Arrived at EDR: 02/06/2024  
Date Made Active in Reports: 04/25/2024  
Number of Days to Update: 79

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3375  
Last EDR Contact: 05/07/2024  
Next Scheduled EDR Contact: 08/19/2024  
Data Release Frequency: No Update Planned

#### NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2019  
Date Data Arrived at EDR: 11/30/2023  
Date Made Active in Reports: 12/01/2023  
Number of Days to Update: 1

Source: Department of Environmental Conservation  
Telephone: 518-402-8651  
Last EDR Contact: 04/25/2024  
Next Scheduled EDR Contact: 08/05/2024  
Data Release Frequency: Quarterly

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018  
Date Data Arrived at EDR: 07/19/2019  
Date Made Active in Reports: 09/10/2019  
Number of Days to Update: 53

Source: Department of Environmental Protection  
Telephone: 717-783-8990  
Last EDR Contact: 04/08/2024  
Next Scheduled EDR Contact: 07/22/2024  
Data Release Frequency: Annually

### WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018  
Date Data Arrived at EDR: 06/19/2019  
Date Made Active in Reports: 09/03/2019  
Number of Days to Update: 76

Source: Department of Natural Resources  
Telephone: N/A  
Last EDR Contact: 03/01/2024  
Next Scheduled EDR Contact: 06/17/2024  
Data Release Frequency: Annually

### Oil/Gas Pipelines

Source: Endeavor Business Media

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

### Electric Power Transmission Line Data

Source: Endeavor Business Media

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**Sensitive Receptors:** There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

### AHA Hospitals:

Source: American Hospital Association, Inc.  
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

### Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services  
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

### Nursing Homes

Source: National Institutes of Health  
Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

### Public Schools

Source: National Center for Education Statistics  
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

### Private Schools

Source: National Center for Education Statistics  
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Daycare Centers: Daycare Listing  
Source: Department of Human Services  
Telephone: 303-866-5958

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.

Source: FEMA  
Telephone: 877-336-2627  
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Riparian Vegetation Data  
Source: Division of Wildlife  
Telephone: 970-416-3360

Current USGS 7.5 Minute Topographic Map  
Source: U.S. Geological Survey

### **STREET AND ADDRESS INFORMATION**

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## **GEOCHECK® - PHYSICAL SETTING SOURCE ADDENDUM**

### **TARGET PROPERTY ADDRESS**

GLENWOOD SPRINGS MUNICIPAL OPERATIONS CENTER  
2302 WULFSOHN RD  
GLENWOOD SPRINGS, CO 81601

### **TARGET PROPERTY COORDINATES**

|                                |                              |
|--------------------------------|------------------------------|
| Latitude (North):              | 39.557838 - 39° 33' 28.22"   |
| Longitude (West):              | 107.354464 - 107° 21' 16.07" |
| Universal Transverse Mercator: | Zone 13                      |
| UTM X (Meters):                | 297717.2                     |
| UTM Y (Meters):                | 4381122.0                    |
| Elevation:                     | 5793 ft. above sea level     |

### **USGS TOPOGRAPHIC MAP**

|                      |                                  |
|----------------------|----------------------------------|
| Target Property Map: | 50011540 GLENWOOD SPRINGS, CO    |
| Version Date:        | 2022                             |
| West Map:            | 50011641 STORM KING MOUNTAIN, CO |
| Version Date:        | 2022                             |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

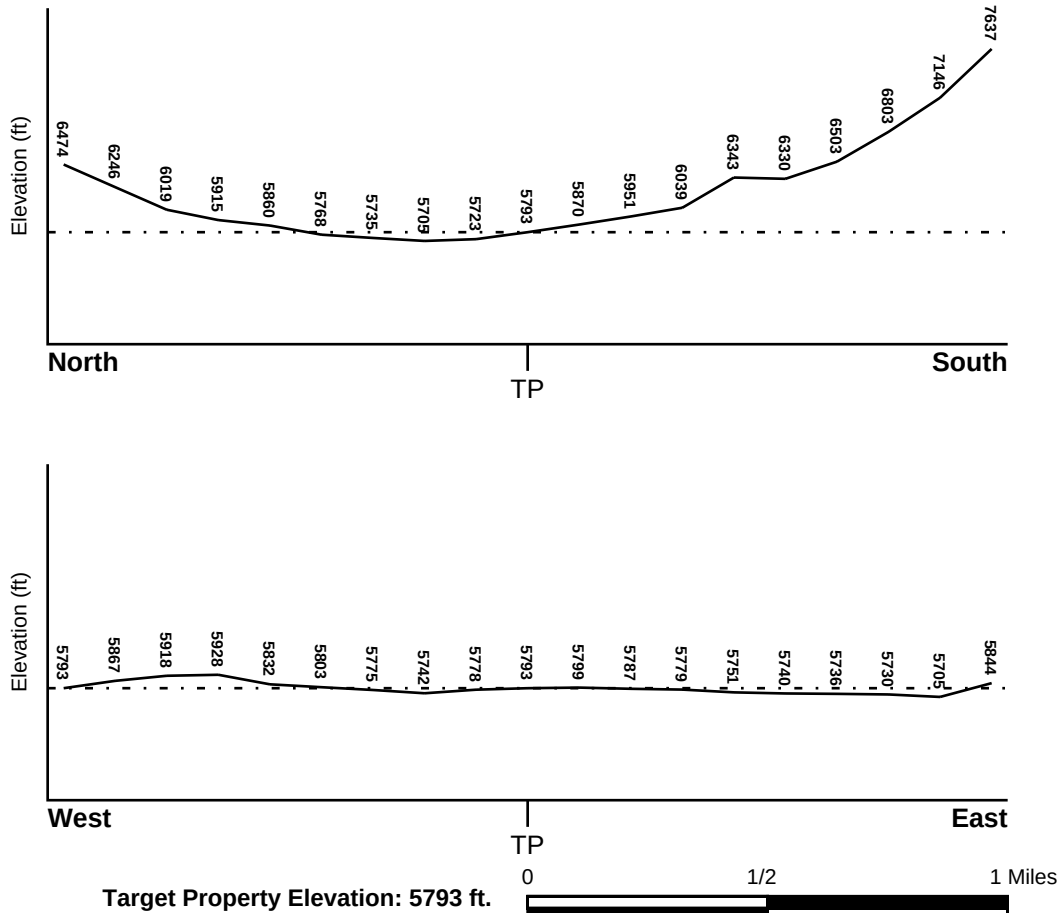
### TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

### TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General North

### SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

### **FEMA FLOOD ZONE**

| <u>Flood Plain Panel at Target Property</u> | <u>FEMA Source Type</u> |
|---------------------------------------------|-------------------------|
|---------------------------------------------|-------------------------|

|              |  |
|--------------|--|
| Not Reported |  |
|--------------|--|

| <u>Additional Panels in search area:</u> | <u>FEMA Source Type</u> |
|------------------------------------------|-------------------------|
|------------------------------------------|-------------------------|

|              |  |
|--------------|--|
| Not Reported |  |
|--------------|--|

### **NATIONAL WETLAND INVENTORY**

| <u>NWI Quad at Target Property</u> |
|------------------------------------|
|------------------------------------|

|               |
|---------------|
| NOT AVAILABLE |
|---------------|

| <u>NWI Electronic<br/>Data Coverage</u> |
|-----------------------------------------|
|-----------------------------------------|

|                                                |
|------------------------------------------------|
| YES - refer to the Overview Map and Detail Map |
|------------------------------------------------|

### HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

### **AQUIFLOW®**

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| <u>MAP ID</u> | <u>LOCATION<br/>FROM TP</u> | <u>GENERAL DIRECTION<br/>GROUNDWATER FLOW</u> |
|---------------|-----------------------------|-----------------------------------------------|
| Not Reported  |                             |                                               |

## **GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY**

### **GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

### **GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

#### **ROCK STRATIGRAPHIC UNIT**

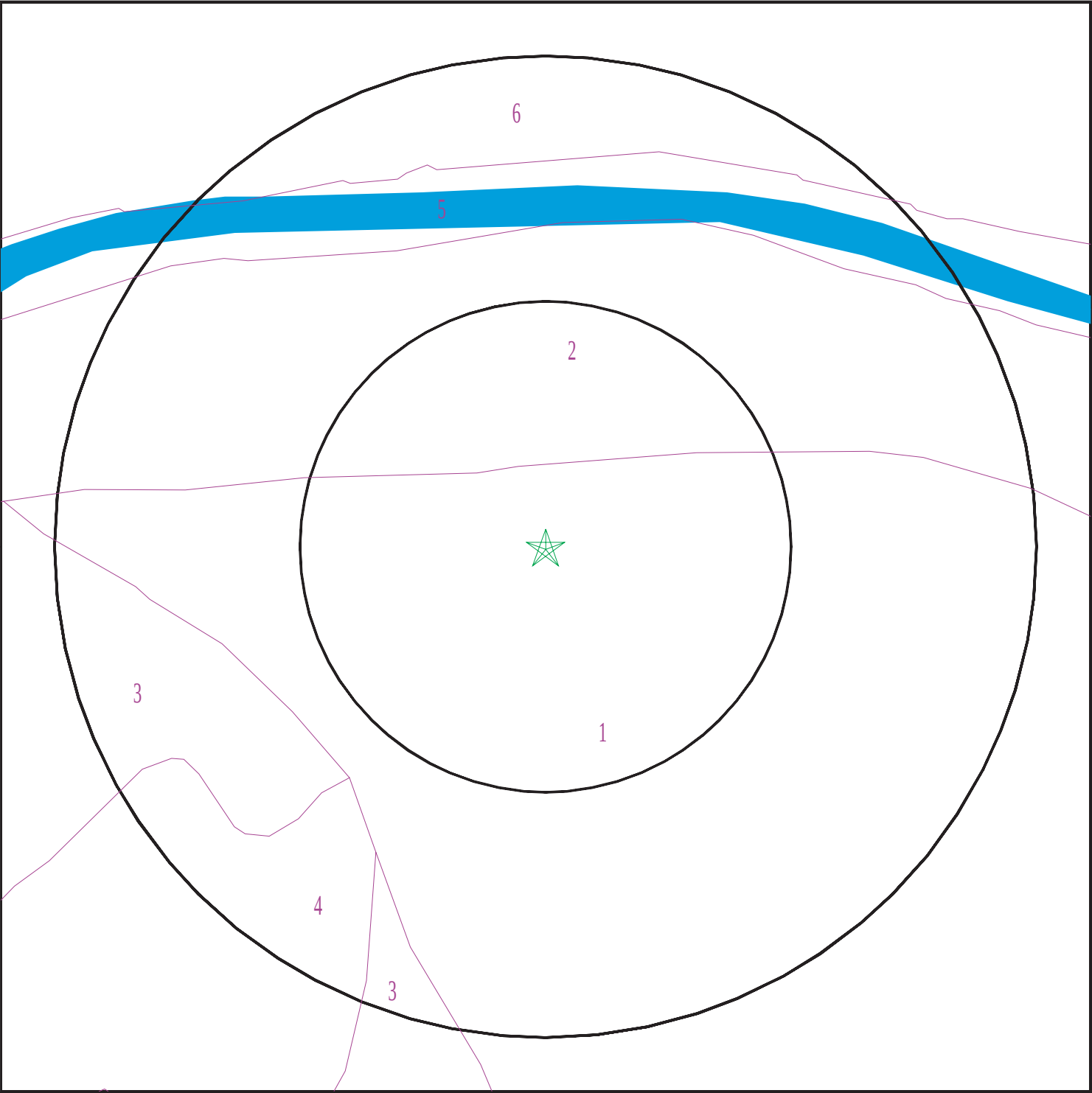
|         |                                                        |
|---------|--------------------------------------------------------|
| Era:    | Paleozoic                                              |
| System: | Ordovician                                             |
| Series: | Lower Paleozoic                                        |
| Code:   | IPz <i>(decoded above as Era, System &amp; Series)</i> |

#### **GEOLOGIC AGE IDENTIFICATION**

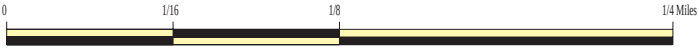
Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 07666145.2r



- ★ Target Property
- SSURGO Soil
- Water



SITE NAME: Glenwood Springs Municipal Operations Center  
ADDRESS: 2302 Wulfsohn Rd  
Glenwood Springs CO 81601  
LAT/LONG: 39.557838 / 107.354464

CLIENT: ERO Resources  
CONTACT: Jacob King  
INQUIRY #: 07666145.2r  
DATE: May 30, 2024 11:06 am

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

#### Soil Map ID: 1

Soil Component Name: Chilton

Soil Surface Texture: channery loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information |           |           |                          |                                                                       |                                                                 |                                              |                      |
|------------------------|-----------|-----------|--------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------|----------------------|
| Layer                  | Boundary  |           | Soil Texture Class       | Classification                                                        |                                                                 | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH)   |
|                        | Upper     | Lower     |                          | AASHTO Group                                                          | Unified Soil                                                    |                                              |                      |
| 1                      | 0 inches  | 12 inches | channery loam            | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel | Max: 42.34<br>Min: 14.11                     | Max: 8.4<br>Min: 7.9 |
| 2                      | 12 inches | 22 inches | very channery sandy loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel | Max: 42.34<br>Min: 14.11                     | Max: 8.4<br>Min: 7.9 |
| 3                      | 22 inches | 59 inches | very cobbly sandy loam   | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel | Max: 42.34<br>Min: 14.11                     | Max: 8.4<br>Min: 7.9 |



## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### Soil Map ID: 2

Soil Component Name: Begay

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information |          |           |                    |                                                                       |                                                                                                                        |                                                 |                      |
|------------------------|----------|-----------|--------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------|
| Layer                  | Boundary |           | Soil Texture Class | Classification                                                        |                                                                                                                        | Saturated hydraulic conductivity<br>micro m/sec | Soil Reaction (pH)   |
|                        | Upper    | Lower     |                    | AASHTO Group                                                          | Unified Soil                                                                                                           |                                                 |                      |
| 1                      | 0 inches | 9 inches  | sandy loam         | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 42.34<br>Min: 14.11                        | Max: 8.4<br>Min: 7.9 |
| 2                      | 9 inches | 59 inches | stony sandy loam   | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 42.34<br>Min: 14.11                        | Max: 8.4<br>Min: 7.9 |

### Soil Map ID: 3

Soil Component Name: Arle

Soil Surface Texture: very stony loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 38 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information |           |           |                       |                                                                                         |              |                                                 |                    |
|------------------------|-----------|-----------|-----------------------|-----------------------------------------------------------------------------------------|--------------|-------------------------------------------------|--------------------|
| Layer                  | Boundary  |           | Soil Texture Class    | Classification                                                                          |              | Saturated hydraulic conductivity<br>micro m/sec | Soil Reaction (pH) |
|                        | Upper     | Lower     |                       | AASHTO Group                                                                            | Unified Soil |                                                 |                    |
| 1                      | 0 inches  | 9 inches  | very stony loam       | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | Not reported | Max: 14.11<br>Min: 0.42                         | Max: Min:          |
| 2                      | 9 inches  | 31 inches | very stony sandy loam | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | Not reported | Max: 14.11<br>Min: 0.42                         | Max: Min:          |
| 3                      | 31 inches | 35 inches | weathered bedrock     | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | Not reported | Max: 14.11<br>Min: 0.42                         | Max: Min:          |

### Soil Map ID: 4

Soil Component Name: Torriorthents

Soil Surface Texture: variable

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 43 inches

Depth to Watertable Min: > 0 inches

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

| Soil Layer Information |           |           |                     |                |              |                                                 |                    |
|------------------------|-----------|-----------|---------------------|----------------|--------------|-------------------------------------------------|--------------------|
| Layer                  | Boundary  |           | Soil Texture Class  | Classification |              | Saturated hydraulic conductivity<br>micro m/sec | Soil Reaction (pH) |
|                        | Upper     | Lower     |                     | AASHTO Group   | Unified Soil |                                                 |                    |
| 1                      | 0 inches  | 3 inches  | variable            | Not reported   | Not reported | Max: 1.41<br>Min: 0.42                          | Max: Min:          |
| 2                      | 3 inches  | 29 inches | fine sandy loam     | Not reported   | Not reported | Max: 1.41<br>Min: 0.42                          | Max: Min:          |
| 3                      | 29 inches | 33 inches | unweathered bedrock | Not reported   | Not reported | Max: 1.41<br>Min: 0.42                          | Max: Min:          |

### Soil Map ID: 5

Soil Component Name: Water

Soil Surface Texture: variable

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class:  
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

### Soil Map ID: 6

Soil Component Name: Azeltine

Soil Surface Texture: gravelly sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information |           |           |                         |                                                                                         |                                                                                                                                       |                                                 |                      |
|------------------------|-----------|-----------|-------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------|
| Layer                  | Boundary  |           | Soil Texture Class      | Classification                                                                          |                                                                                                                                       | Saturated hydraulic conductivity<br>micro m/sec | Soil Reaction (pH)   |
|                        | Upper     | Lower     |                         | AASHTO Group                                                                            | Unified Soil                                                                                                                          |                                                 |                      |
| 1                      | 0 inches  | 18 inches | gravelly sandy loam     | Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand. | COARSE-GRAINED SOILS, Gravels, Clean Gravels, Well-graded gravel.<br>COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel. | Max: 705<br>Min: 141.14                         | Max: 8.4<br>Min: 7.4 |
| 2                      | 18 inches | 59 inches | extremely gravelly sand | Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand. | COARSE-GRAINED SOILS, Gravels, Clean Gravels, Well-graded gravel.<br>COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel. | Max: 705<br>Min: 141.14                         | Max: 8.4<br>Min: 7.4 |

### LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

### WELL SEARCH DISTANCE INFORMATION

| <u>DATABASE</u>  | <u>SEARCH DISTANCE (miles)</u> |
|------------------|--------------------------------|
| Federal USGS     | 0.125                          |
| Federal FRDS PWS | Nearest PWS within 1 mile      |
| State Database   | 0.000                          |

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

### FEDERAL USGS WELL INFORMATION

| MAP ID                      | WELL ID                     | LOCATION<br>FROM TP         |
|-----------------------------|-----------------------------|-----------------------------|
| <u>                    </u> | <u>                    </u> | <u>                    </u> |
| No Wells Found              |                             |                             |

### FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

| MAP ID                      | WELL ID                     | LOCATION<br>FROM TP         |
|-----------------------------|-----------------------------|-----------------------------|
| <u>                    </u> | <u>                    </u> | <u>                    </u> |
| No PWS System Found         |                             |                             |

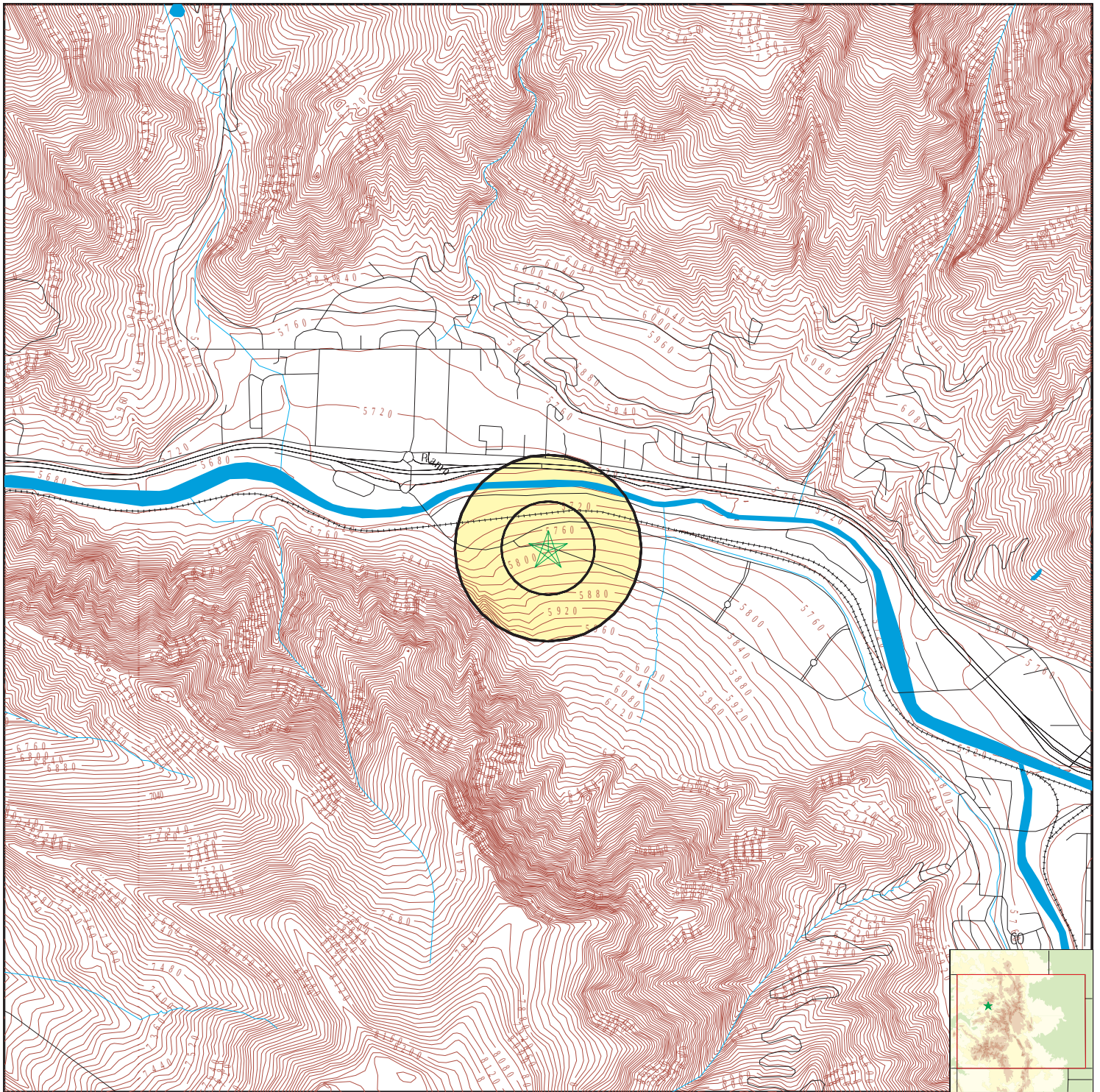
Note: PWS System location is not always the same as well location.

### STATE DATABASE WELL INFORMATION

| MAP ID                      | WELL ID                     | LOCATION<br>FROM TP         |
|-----------------------------|-----------------------------|-----------------------------|
| <u>                    </u> | <u>                    </u> | <u>                    </u> |
| No Wells Found              |                             |                             |



# PHYSICAL SETTING SOURCE MAP - 07666145.2r



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Oil, gas or related wells

0 1/4 1/2 1 Miles



SITE NAME: Glenwood Springs Municipal Operations Center  
 ADDRESS: 2302 Wulfsohn Rd  
 Glenwood Springs CO 81601  
 LAT/LONG: 39.557838 / 107.354464

CLIENT: ERO Resources  
 CONTACT: Jacob King  
 INQUIRY #: 07666145.2r  
 DATE: May 30, 2024 11:06 am



# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS RADON

## AREA RADON INFORMATION

State Database: CO Radon

### Radon Test Results

| Zip   | Total Sites | Avg  | % sites<=4 pCi/L | % sites>4<10 pCi/L | % sites>=10<20 pCi/L | % sites>20 pCi/L |
|-------|-------------|------|------------------|--------------------|----------------------|------------------|
| 81601 | 16          | 5.04 | 56.25            | 37.50              | 0.00                 | 6.25             |

Federal EPA Radon Zone for GARFIELD County: 1

Note: Zone 1 indoor average level > 4 pCi/L.  
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.  
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 81601

Number of sites tested: 1

| Area                    | Average Activity | % <4 pCi/L   | % 4-20 pCi/L | % >20 pCi/L  |
|-------------------------|------------------|--------------|--------------|--------------|
| Living Area - 1st Floor | Not Reported     | Not Reported | Not Reported | Not Reported |
| Living Area - 2nd Floor | Not Reported     | Not Reported | Not Reported | Not Reported |
| Basement                | 7.400 pCi/L      | 0%           | 100%         | 0%           |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

### USGS 7.5' Digital Elevation Model (DEM)

Source: United States Geologic Survey

EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

### Current USGS 7.5 Minute Topographic Map

Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

**Flood Zone Data:** This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.

Source: FEMA

Telephone: 877-336-2627

Date of Government Version: 2003, 2015

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

### State Wetlands Data: Riparian Vegetation Data

Source: Division of Wildlife

Telephone: 970-416-3360

## HYDROGEOLOGIC INFORMATION

### AQUIFLOW<sup>R</sup> Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

### Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

### STATSGO: State Soil Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

### SSURGO: Soil Survey Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)

Telephone: 800-672-5559

SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

### FEDERAL WATER WELLS

#### PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

#### PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

#### USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

### STATE RECORDS

#### Colorado GIS Well Database

Source: Office of State Engineer, Division of Water Resources

Telephone: 303-866-3581

The GIS Well database includes all wells that the Division of Water Resources permits.

## OTHER STATE DATABASE INFORMATION

#### Oil and Gas Well Locations

Source: Department of Natural Resources

Telephone: 303-894-2100

### RADON

#### State Database: CO Radon

Source: Department of Public Health & Environment

Telephone: 303-692-3090

Radon Study in Colorado

#### Area Radon Information

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

#### EPA Radon Zones

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

### OTHER

#### Airport Landing Facilities: Private and public use landing facilities

Source: Federal Aviation Administration, 800-457-6656

#### Epicenters: World earthquake epicenters, Richter 5 or greater

Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

## PHYSICAL SETTING SOURCE RECORDS SEARCHED

### STREET AND ADDRESS INFORMATION

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**Glenwood Springs Municipal Operations Center**

2302 Wulfsohn Rd

Glenwood Springs, CO 81601

Inquiry Number: 7666145.5

May 31, 2024

## The EDR Aerial Photo Decade Package



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

## EDR Aerial Photo Decade Package

05/31/24

**Site Name:**

Glenwood Springs Municipal O  
2302 Wulfsohn Rd  
Glenwood Springs, CO 81601  
EDR Inquiry # 7666145.5

**Client Name:**

ERO Resources  
1626 Cole Boulevard, Suite 100  
Lakewood, CO 80401  
Contact: Jacob King



Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

**Search Results:**

| <u>Year</u> | <u>Scale</u> | <u>Details</u>                       | <u>Source</u> |
|-------------|--------------|--------------------------------------|---------------|
| 2019        | 1"=500'      | Flight Year: 2019                    | USDA/NAIP     |
| 2015        | 1"=500'      | Flight Year: 2015                    | USDA/NAIP     |
| 2011        | 1"=500'      | Flight Year: 2011                    | USDA/NAIP     |
| 2006        | 1"=500'      | Flight Year: 2006                    | USDA/NAIP     |
| 1999        | 1"=500'      | Flight Date: September 07, 1999      | USGS          |
| 1993        | 1"=500'      | Acquisition Date: September 03, 1993 | USGS/DOQQ     |
| 1989        | 1"=500'      | Flight Date: July 19, 1989           | USGS          |
| 1983        | 1"=500'      | Flight Date: September 10, 1983      | USDA          |
| 1979        | 1"=500'      | Flight Date: September 07, 1979      | USGS          |
| 1960        | 1"=500'      | Flight Date: August 18, 1960         | USGS          |
| 1955        | 1"=500'      | Flight Date: October 16, 1955        | USGS          |

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INQUIRY #: 7666145.5

YEAR: 2019

— = 500'







INQUIRY #: 7666145.5

YEAR: 2015

— = 500'







INQUIRY #: 7666145.5

YEAR: 2011

— = 500'







INQUIRY #: 7666145.5

YEAR: 2006

— = 500'





INQUIRY #: 7666145.5

YEAR: 1999

— = 500'







INQUIRY #: 7666145.5

YEAR: 1993

— = 500'



Subject boundary not shown because it exceeds image extent or image is not georeferenced.





INQUIRY #: 7666145.5

YEAR: 1989

— = 500'





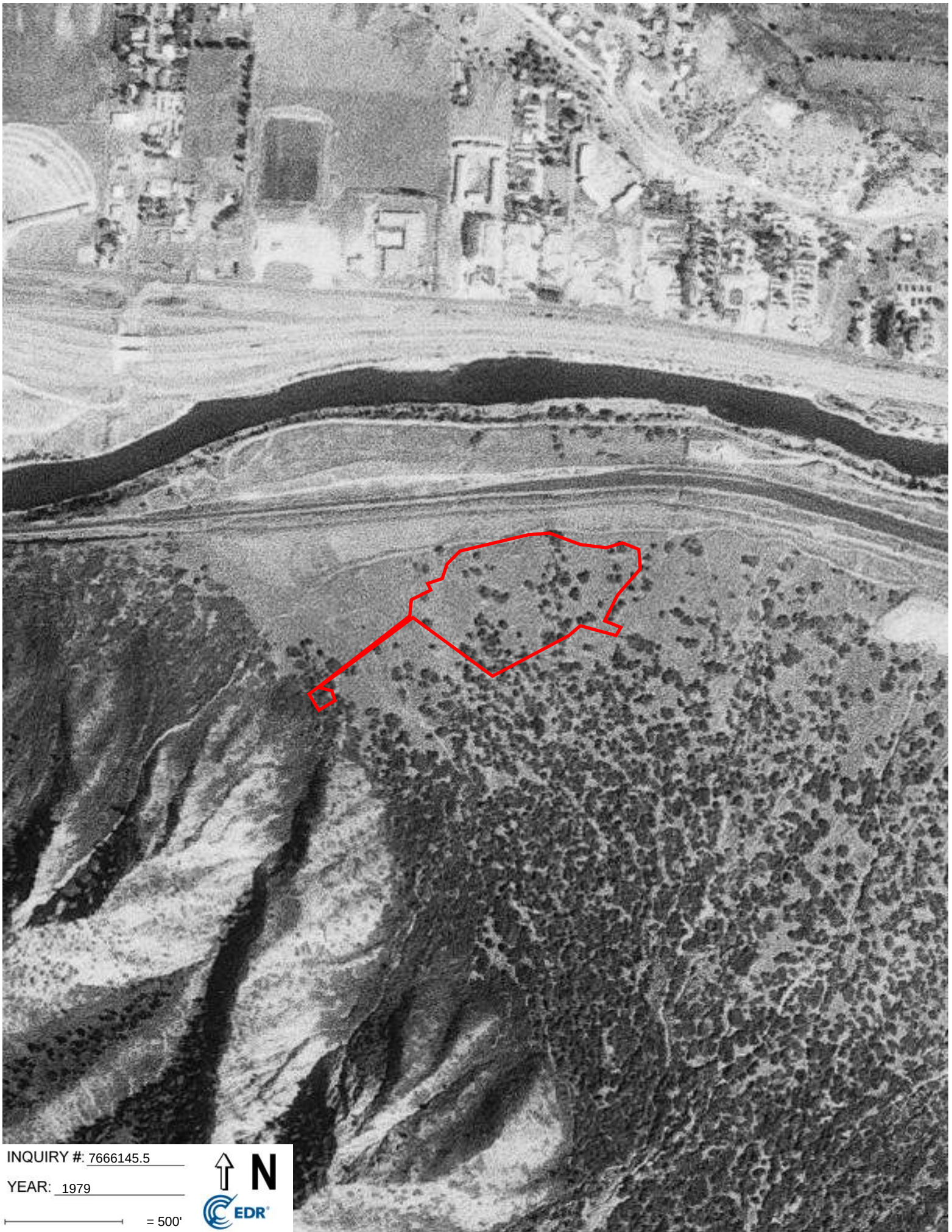
INQUIRY #: 7666145.5

YEAR: 1983

— = 500'







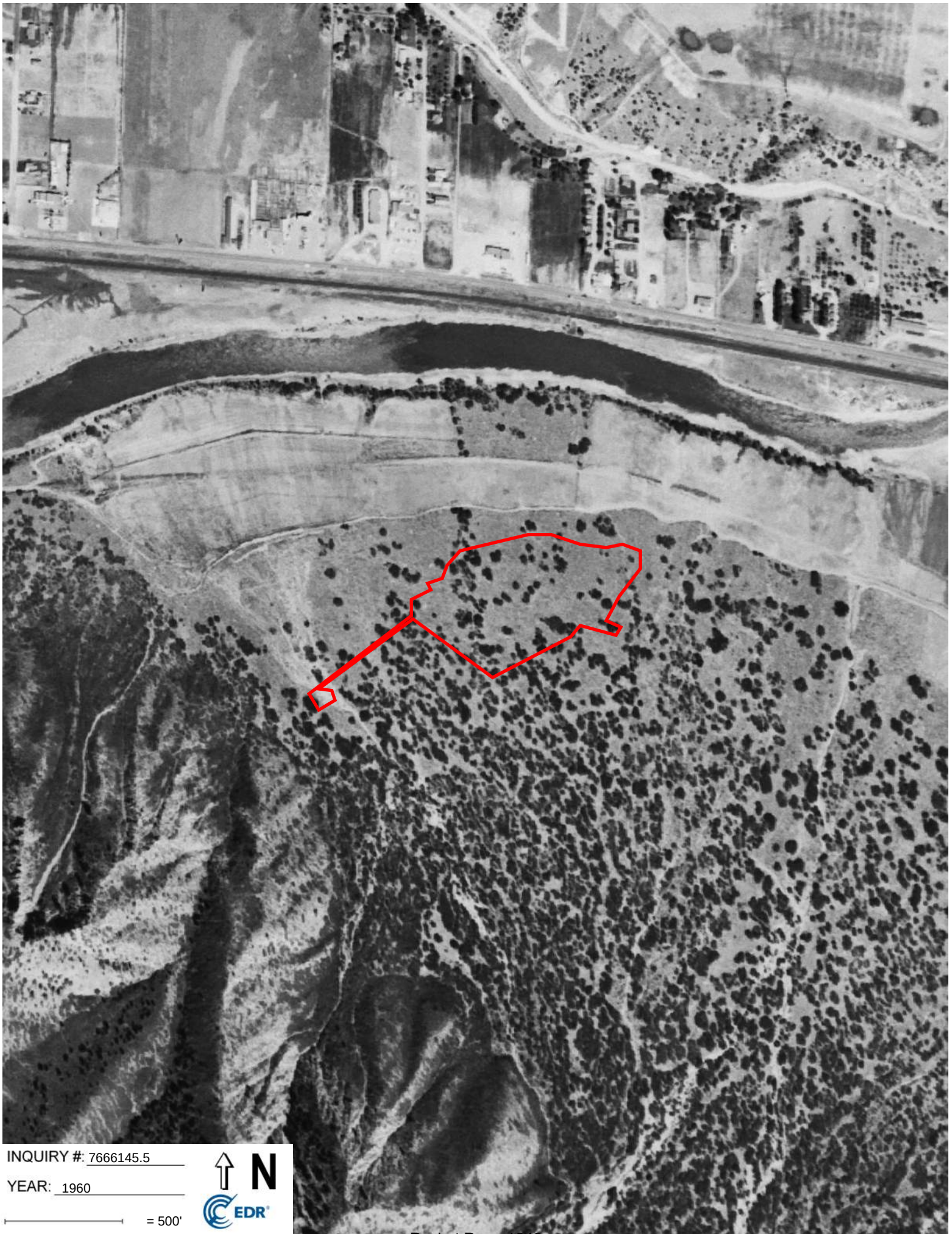
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YEAR: 1979

— = 500'







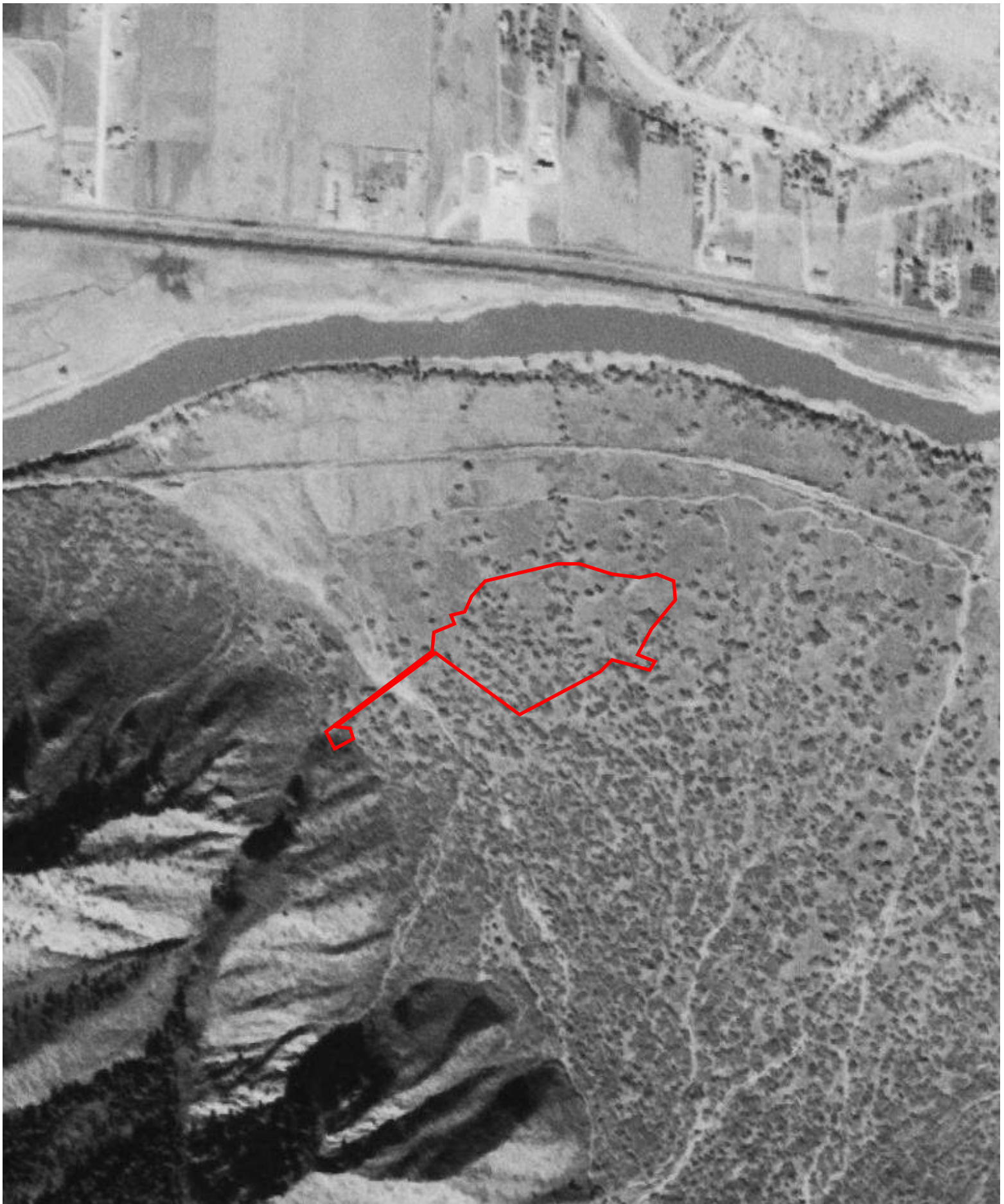
INQUIRY #: 7666145.5

YEAR: 1960

— = 500'







INQUIRY #: 7666145.5

YEAR: 1955

— = 500'





Glenwood Maintenance Facility Expansion  
W.G. Transit Center & Administration Offices  
Phase 6 – Phase 8  
Glenwood Springs, Colorado

## 100% Schematic Design Narrative



Prepared by SEH and their Design Consultants





## **General Information**

### **A. Project Description**

1. Nestled in the scenic landscapes of Glenwood Springs, Colorado, the Roaring Fork Transportation Authority (RFTA) Transit Center, Administration Building and Storage Building aim to provide a productive workplace environment and unparalleled transportation services to the vibrant community of Glenwood Springs.

### **B. Scope of Work**

1. The project spans across three distinct phases – Phase 6A, Phase 6B, and Phase 8



### **Phase 6A – Transit Center**

- A.** Phase 6A will be a single-level building occupying 3,093 gross square feet designed to function as a Transportation Hub offering a welcoming and comfortable environment for its users. The station houses a spacious lobby/waiting area and ticketing area where passengers can purchase tickets for their journeys. Furthermore, the station features essential support spaces, including a bus driver lounge area, and a kitchenette, catering to the diverse needs of both passengers and staff. Complementing its functional interior, the exterior of the building is adorned with carefully landscaped surroundings, complete with benches to accommodate waiting passengers and facilitate efficient bus activities.

### **Phase 6B – W.G. Administration Building**

- A.** Phase 6B consists of the development of a 22,956 gross square feet three-story building designed not only to cater to RFTA's existing administrative needs but also anticipate future growth by prioritizing flexibility and efficiency. This facility will function as the center for RFTA's administrative functions, housing offices, meeting rooms, and support spaces tailored to various departments. From administration and finance to procurement and marketing, the complex accommodates the diverse needs of RFTA's administrative activities. In addition, the design also incorporates multiple coffee station, a small workout space and multiple exterior spaces, including a Roof Balcony on the third floor, for the

enjoyment of employees during their breaks. Furthermore, this phase encompasses the development of the parking area, landscaping, and a pedestrian bridge, designed to provide easy access from Wulfsohn Rd.

### **Phase 8 – Storage Building**

- A.** In Phase 8, RFTA addresses the crucial need for storage infrastructure to support its day-to-day activities. This one-story storage building is purposefully designed to accommodate the storage of materials and resources essential for RFTA's operations.
- B.** Our design philosophy for this project aligns closely with the RFTA WG Transit Center and Administration Building Program of Requirements, with a focus on addressing specific operational, administrative, expansion, environmental, and safety concerns.
- C.** Safety stands as the highest priority, considering the inherent risks associated with coordinating pedestrians, buses, and Wulfsohn Road traffic on the existing site. Furthermore, our commitment to sustainable practices resonates with the RFTA's dedication to the environment. While the project aims to implement efficient energy strategies where feasible, it will not pursue green building endorsements.
- D.** Embracing the architectural and aesthetic essence of western Colorado and the surrounding community, our design ensures alignment with local planning regulations. In addition our design also ensures compliance with all regulatory provisions and aims to meet or exceed all requirements while serving the best interests of RFTA and the community.

### **Landscape Design**

#### **Phase 6A – Transit Center**

- A.** The landscape for the transit station is designed to provide visual interest, guide wayfinding, and provide shelter and gathering space.
- B.** Raised planters located throughout the platform provide a purposeful circulation experience, guiding transit users towards bus queuing zones and to the shelter of the station building. The planters are organically shaped and are envisioned to be tilted and varying in height, mimicking the dynamic flow of water through local riverways. This sense of movement also evokes the eddy and flow of people traveling through the station and up and down valley.
- C.** While the planters provide a physical clue for the flow of pedestrian traffic, bench seating and two canopy shelters provide places for rest, gathering, and protection from the elements.
- D.** The benches are shown as separate from the planters, which allows for flexibility in form and materiality of the planters as they do not need to necessarily function as seating. Benches in the form of site furnishings also allows the seating to more easily work with the slope of the platform. Benches with and without backrests are shown on the plan. An off-the-shelf product manufactured in both backless and with backrests will help unify the overall aesthetic and also keep maintenance of site furnishings straightforward.
- E.** Two overhead canopies are provided; one is located on the eastern side of the platform and one is located on the western side. These canopies are associated with seating, but are also large enough to provide standing room as well. The roof forms of the canopies would echo the angle of the Station building architecture, but in shed form.
- F.** There is an enclosed bike storage building shown to the west of the Station building. This building would include internal, secured bike storage, with the roof extending past the footprint on the long axis to create exterior covered bike parking.

- G. Trees are located to provide shade, reinforce wayfinding, and provide visual interest. Shade trees are located in the platform hardscape, while smaller ornamental trees are located in the planters. Herbaceous plantings are for the most part contained within the planters. The plant palette for the platform emphasizes drought tolerant woody and herbaceous plant material, with an emphasis on low maintenance groundcovers, shrubs, and grasses.
- H. The landscape downhill from the transit center, associated with the surface parking and to the west and north of the platform, is envisioned as an extension of the existing native plant palette at the Wulfsohn Road-Midland Avenue intersection. This palette will create a seamless landscape aesthetic when viewed from Midland Avenue or from the west.

### **Phase 6B – W.G. Administration Building**

- I. The landscape for the administration building is designed to meet the POR stated program needs and create a unique identity with some echoing of elements found at the transit center.
- J. The design provides a strong emphasis of the building entry by locating planters to direct views towards the front doors and reinforce the angle of the architectural canopy and vestibule. The planters are visible when vehicles enter the parking lot, providing an early indication that this is an important location.
- K. At the rear of the building, an outdoor space with patio is shown with casual seating, a picnic table with overhead canopy, trees, and an artificial turf area. The patio is approximately 80' x 25' feet and 2000 square feet in area. This outdoor space can accommodate individual employee breaks or larger groups spilling out from the multi-purpose room. Amphitheater style steps are shown on the south west side of the patio near the covered picnic table. This area can be used for outdoor classroom space or informal gatherings.
- L. The patio steps down to the native landscape where a soft-surface path creates an informal circuit with benches oriented towards the western view. This is a place where employees can have a private moment, take a phone call, or get up from their desks and move around.

### **Phase 8 – Storage Building**

- A. There is no ornamental landscaping associated with the storage building. Where site disturbance occurs, the revegetation shall consist of native plant material that will visually blend with the existing sagebrush meadow.

## **Architectural Design**

- A. Our design philosophy for this project aligns closely with the RFTA WG Transit Center and Administration Building Program of Requirements, with a focus on addressing specific operational, administrative, expansion, environmental, and safety concerns.
- B. Safety stands as the highest priority, considering the inherent risks associated with coordinating pedestrians, buses, and Wulfsohn Road traffic on the existing site. Furthermore, our commitment to sustainable practices resonates with the RFTA's dedication to the environment. While the project aims to implement efficient energy strategies where feasible, it will not pursue green building endorsements.
- C. Embracing the architectural and aesthetic essence of western Colorado and the surrounding community, our design ensures alignment with local planning regulations. In addition our

design also ensures compliance with all regulatory provisions and aims to meet or exceed all requirements while serving the best interests of RFTA and the community.

**D. Building Program Requirements**

1. Refer to Appendix for updated Building Program Requirements.

**Phase 6A – Transit Station**

- A.** The Project consists of one new BRT Station in Glenwood Springs, CO. The BRT Station will be one-story and include spaces which support buses on routes, customer service, storage, and driver support.

1. Area: appx. 3,093 gsf
2. Stories/Height: 1 Story / 21'-8"
3. Occupancy: Business (per IBC 2021)
4. Construction Type: Type II-B (per IBC 2021)
5. Sprinklers: NFPA 13 (full)
6. Frontage: Min 30 feet on all sides

**Phase 6B – Administration Building**

- B.** The Project consists of one new administration building in Glenwood Springs, CO. The administration building will be three-story and include spaces which support the Owner's administration and planning staff, facility management, and maintenance staff and operations.

1. Area: appx. 31,383 gsf
2. Stories/Height: 3 Stories / 41'-10"
3. Occupancy: Business (per IBC 2021)
4. Construction Type: Type II-B (per IBC 2021)
5. Sprinklers: NFPA 13 (full)
6. Frontage: Min 30 feet on all sides

**Phase 8 – Storage Building**

- C.** The Project consists of one new maintenance building in Glenwood Springs, CO. The maintenance building will be one-story and include spaces which support the Owner's vehicle fleet maintenance operations.

1. Area: appx. 3,640 gsf
2. Stories/Height: 1/20 feet
3. Occupancy: Storage, Business (per NFPA 5000)
4. Construction Type: Type II-000 (per NFPA 5000)
5. Sprinklers: NFPA 13 (full)
6. Frontage: Min 30 feet on three sides

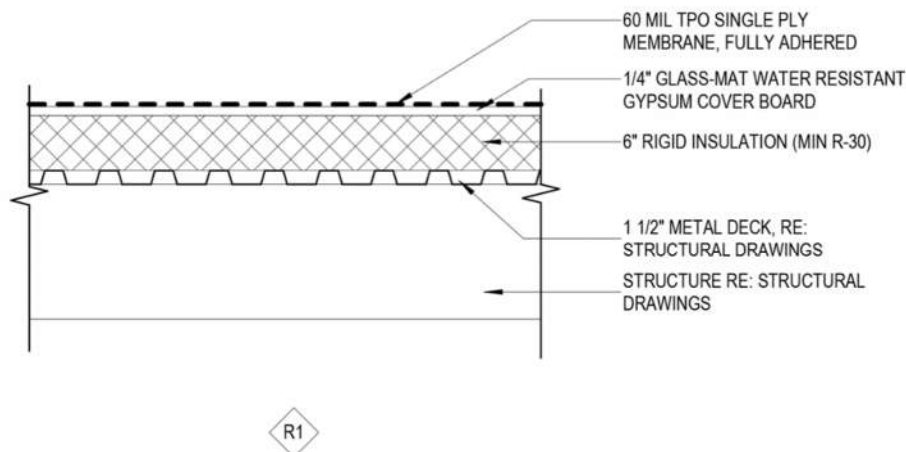
**D. Exterior Wall Systems**

1. Phase 6A – Transit Station
  - i) Metal Stud Wall w/ Stone Venner or Hardi Plan
2. Phase 6B – Administration Building

- i) Precast Concrete wall with Stone / Brick Vanner
- 3. Phase 8 – Storage Building
  - i) CIP Concrete with CMU Vanner

#### E. Roofing Systems

1. There are two main types of roof systems: low-slope and steep-slope roofs. Low-slope roofs have a slope between 1/4 inch per foot and 3 in 12, while steep-slope roofs have a pitch greater than 3 in 12.
2. Low-Slope Roof Systems
  - i) Include membrane roofs that must meet specific conditions to ensure adequate performance. Firstly, the minimum slope for low-slope roofs must be 1/4 inch per foot. Secondly, all low-slope roofs must be cool roofs to improve energy performance. Cover boards must also be provided above the insulation for all low-slope roofs.
  - ii) Additionally, all membrane roofs must be fully adhered, and ideally, should slope toward the perimeter of the building to prevent water from ponding on the roof. When interior drains are used, it's important to consider eliminating potential water ponding and debris collection at the drain to maintain the roof's integrity. By adhering to these approved low-slope roof conditions, the design will ensure that the roofing systems are efficient, durable, and reliable.
  - iii) Roof design is intended to provide positive drainage.
  - iv) The minimum acceptable roof slope is 1/4 inch per foot
  - v) Roof drains are located along the roof perimeter
  - vi) Each roof drain shall be accompanied by an overflow drain.
  - vii) Membrane shall be 60 mills TPO single ply membrane (type III, reinforced,) fully adhered, high reflectivity
  - viii) The roof waterproofing membrane system shall be highly resistive to physical damage.



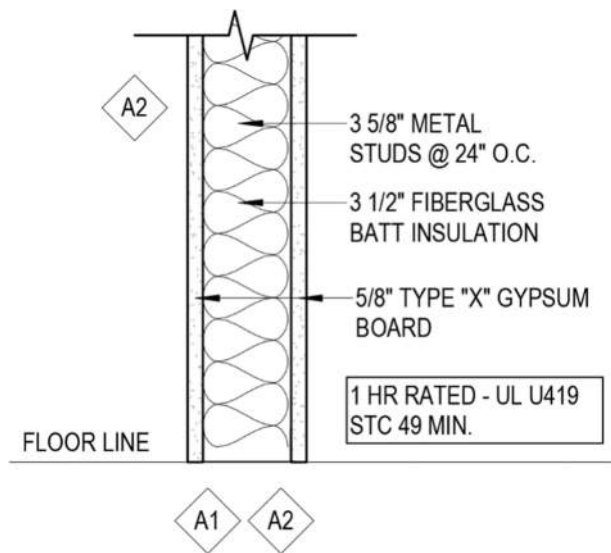
3. Roof accessories: roof hatches to access roof levels
  - i) Roof ladders where required to access all roof levels not accessibly by hatch

- ii) Walkway pads at all hatches, ladders and equipment requiring maintenance and other high traffic areas
- 4. Canopies and Shade Structures
  - i) Metal clad canopies are provided at entry locations
- 5. Steep-Slope Roof Systems
  - i) The slope of the roof must be at least 3 units vertical in 12 units horizontal. Additionally, in colder climates, ice and water shield must be installed on steep-slope roofs to prevent damage caused by ice dams.
  - ii) Roof drains are located along the roof perimeter
  - iii) Each roof drain shall be accompanied by an overflow drain.
  - iv) Membrane shall be 60 mills TPO single ply membrane (type III, reinforced,) fully adhered, high reflectivity
  - v) The roof waterproofing membrane system shall be highly resistive to physical damage.
- 6. Roof Flashing
  - i) Copings and Flashings
    - (1) Prefinished metal to match building finishes

#### **F. Interior Partitions**

- 1. Interior Partitions shall be 5/8" minimum Gypsum Board over Metal stud framing at 16" on center.
- 2. Interior Partition Selection Criteria
  - i) At areas where sound transmission is a concern (offices, or conference spaces) sound attenuating batt insulation and acoustic sealant will be utilized.
  - ii) Where greater sound isolation is required, improved sound walls will be implemented including sound attenuating batt insulation with multiple layers of gypsum board and resilient channels.
  - iii) Sound walls shall use acoustical sealant, and penetrations shall be limited and staggered between stud spacing.
  - iv) Acoustical separation requirements and acoustical ratings description:
    - (1) 1hr rated – UL U419 – STC 40 min.
    - (2) 2hr rated - UL U419 - STC 52 min.
- 3. Finishes
  - i) Gypsum board: Type X, level-4 finish at exposed areas.
  - ii) Wall finishes are selected based on their ability to withstand moderate to heavy abuse as well as ability to be maintained by maintenance personnel.
  - iii) Toilet Rooms: Restroom walls shall be porcelain or glazed tile from floor to a minimum of 6'-0" above finished floor. If tile is not taken to the ceiling, paint shall be epoxy. Shower wall shall be porcelain or glazed tile from floor to ceiling.





#### 4. Design Flexibility

- i) Abuse resistant gypsum board will be applied depending on the nature of the space and may be single sided or on both sides where partitions separate similar activities.

### G. Thermal and Moisture Protection

#### 1. Exterior walls:

- i) 3 inch Continuous Polyisocyanurate Foam-Plastic Board Insulation (R: 6.8/inch) total R value of 20.4
- ii) Minimum R13 Glass-fiber blanket insulation

#### 2. Roof:

- i) 5 inch Polyisocyanurate Foam-Plastic Board Insulation (R:6.8/inch) total r value of 34

#### 3. Maintenance Structures:

##### i) Exterior walls:

- (1) 3 inch Continuous Polyisocyanurate Foam-Plastic Board Insulation (R: 6.8/inch) total R value of 20.4
- (2) Minimum R13 Glass-fiber blanket cavity insulation

##### ii) Roof:

- (1) 5 inch Polyisocyanurate Foam-Plastic Board Insulation (R:6.8/inch) total R value of 34

- iii) Breaks in the thermal barrier should be avoided whenever possible. The Designer of Record shall provide design and details that allow for continuous insulation for all building components.

- iv) All fiberglass insulation shall be formaldehyde free and conform to ASTM C665 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

- v) Rigid insulation must conform to ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

- vi) Air Barriers

- vii) Vapor Retarder

- viii) Moisture Barrier
- ix) Flashing
- 4. Exterior Windows
  - i) 1-inch insulated units w/ low-e coating.
  - ii) Tinting off the glazing shall be provided to reduce glare and heat gain.
  - iii) Thermally broken aluminum frame construction
  - iv) Commercial grade and vandal resistant hardware
- 5. Interior Windows
  - i) Window units are provided to facilitate supervision between interior spaces.
  - ii) Tempered at safety locations, heat-strengthened where required, and meeting requirements for fire-resistant glazing at rated locations.
  - iii) 1" clear float glass panes
  - iv) Steel hollow metal frames
- 6. Entry and Storefront Systems
  - i) Heavy duty 4-1/2-inch thermally broken aluminum framing systems
  - ii) 1-inch insulated glazing and low-E coating.
  - iii) Glazing at ground doors and as specified in code shall be tempered safety glass
  - iv) Stiles shall be at minimum 2" thick
  - v) Center mullions provided at double entry doors

## **H. Door Systems**

- 1. Steel Doors
  - i) Interior steel doors shall meet the requirements of SDI-100 Grade II – Heavy Duty 1-3/4" thick; 18 gage faces, seamless. Interior steel doors over 36" wide shall meet the requirements of SDI-100 Grade III – Extra Heavy Duty 1-3/4" thick; 16 gage faces, seamless. Interior steel frames shall be minimum 16 gage steel (minimum 14 gage steel for openings over 36" wide). Provide galvanized doors and frames to ASTM A653/A653M Class 60 where humidity or wash-down operations are present.
  - ii) All doors shall be sized to facilitate movement of equipment (new or replacement). All doors shall be a minimum of 3'-0" wide and 7'-0" high.
- 2. Wood Doors
  - i) Wood doors may include vision panels and additional features without compromising performance. Doors may have power assist or electronic locking mechanisms. Fabrication standards must meet industry requirements, with hollow metal frames factory primed. Wood doors must use bonded structural composite core, AWI Premium Grade, with shop-finished hardwood veneer. Grade 1 heavy-duty mortise locks are required. Frames should be Level 3, 0.053-inch thick galvanized, with a lifetime warranty, STC 45, and a 15-minute forced entry rating. All doors must facilitate equipment movement, with a minimum width of 3 feet and height of 7 feet.
- 3. Frames
  - i) Interior frames shall be fully welded hollow metal, 16 gauge, fully grouted at masonry and spot grouted at rated stud walls. Frames shall be fully prepped for hardware including 12 gauge reinforcing where applicable. Ratings and labels as required.
- 4. Access Doors
  - i) Typical interior access doors shall be a minimum of 30" x 30" minimum and sized for equipment that the opening serves.
  - ii) Frame: 16 gage steel, 1" wide flange; reinforce at strike.
  - iii) Panel: 14 gage steel, sandwich type; reinforce at latch; baked enamel primer coat.

- iv) Hardware: concealed, pin-type, 175° opening hinge; self-latching, lever-handle – operable from both sides; screwdriver operated, metal cam lock.
- 5. Hardware
  - i) All door assemblies installed in the means of egress shall meet the requirements of the National Fire Protection Association (NFPA), 101 Life Safety Code.
  - ii) All hardware to have a minimum 2-year warranty unless noted otherwise.
  - iii) Door closers shall be LCN 4040-series closers with 10-year warranty.
  - iv) Hinges shall be maintenance free with lifetime warranty.
  - v) Exit devices shall be Von Duprin 99-series exit devices with 3-year warranty.
  - vi) Surface flush bolts and floor mounted doorstops are not permitted.
  - vii) Avoid overhead stops.
  - viii) Provide drip edge, door bottom, astragal, gasketing as appropriate for the location and use.
  - ix) All Hardware shall be satin chromium/stainless finish, dependent upon base metal:
    - (1) BHMA Finish Standard #626 (US Standard Finish US26D)
    - (2) BHMA Finish Standard #628 (US Standard Finish US28)
    - (3) BHMA Finish Standard #652 (US Standard Finish US26D)
    - (4) BHMA Finish Standard #630 (US Standard Finish US32D)

#### **I. Signage Systems**

1. Interior Signage: As required by code, all rooms will be identified at their respective entries with an accessible sign. Each room sign will include the room name and room number which correspond to the building plan and fire alarm system plans. The name and number designations will be shown both in contrasting text and accessible Braille lettering.
2. Attach signs to wall surfaces using mounting tape squares in each corner of the sign except at each top corner and one centered at bottom of sign for 6" x 6" units. Bathroom signs are to be 8" wide x 9" high. All doors shall to be numbered with a sign on the upper frame of the door.
3. Locate surface-mounted signs on the wall adjacent to the latch side of the door (or the nearest adjacent wall) at 60" above finished floor from the centerline of the sign (any size) and out of the swing of the door. Mount signs with right edge 4" from inside face of the door jamb.
4. Exterior Building Signage: The building's design should allow space for the name on the front elevation. Individually cut or cast metal letters shall be provided.

#### **J. Interiors**

1. Finishes have been selected per the requirements stated in the RFTA WG Transit Center and Administration Building – Program of Requirements.
2. Ceilings
  - i) Ceiling heights shall be a minimum of 9'-0" above finished floor.
3. Acoustical Ceilings:

Surface Texture: Fine textures with perforations.

Acoustics Open Office: NRC ≥ 0.85; CAC ≥ 35  
 Privacy Index ≥ 80%  
 Sound Masking 45-48 dBA  
 Reverberation Time ≥.8 sec

|                            |                                                                                                                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acoustics Enclosed Office: | NRC $\geq$ 0.60; CAC $\geq$ 35<br>Privacy Index > 80%<br>Sound Masking 40-42 dBA<br>Reverberation Time 0.6 sec,                                                                                                                 |
| Durability:                | Impact Resistance<br>Scratch Resistance<br>Moisture resistance.                                                                                                                                                                 |
| Maintenance:               | Cleanable,                                                                                                                                                                                                                      |
| Warranty:                  | 30 Year Systems Warranty                                                                                                                                                                                                        |
| Environmental:             | Total Recycled Content >20%<br>Recycled in a closed loop process back to Manufacturer<br>USDA Certified Bio-Preferred<br>Light Reflectance >85%, CDPH/EHLP/V 1.1 2010<br>Product EPD Available<br>Safety Data Sheet 10,000 ppm. |

- i) Ceiling tiles below service items shall be uncut, easily removed, and shall be free of devices and fixtures.
- 4. Gypsum Ceilings:
  - i) Gypsum ceilings and soffits shall be painted with flat paint finish except as noted. Restrooms, showers, and housekeeping rooms shall be gypsum ceiling with gloss epoxy paint finish.
- 5. Above Ceiling Access:
  - i) Provide access as required for access to service and maintenance items above ceiling. Access shall not be hindered by fixtures or devices in ceiling panels, or by conduit, pipes, et.
- 6. Floor Finishes
  - i) Carpet:
    - (1) Broadloom/m/Carpet Tile: Texture appearance retention rating of 3 or higher (Heavy traffic). Type 6 or Type 6, BCF Nylon. 10-year warranty. 10% Post-Consumer Recycled Content. NSF 140 Gold Level Certified. If broadloom, provide pad. Provide 4" rubber straight base molding – corners and special shapes shall be factory-made (no field bends permitted).
  - ii) Resilient Tile:
    - (1) Vinyl Composition Tile: Standard VCT. Class I Solid Color; Class II Through Pattern. Thickness of 0.125" or greater. Static load limit greater than or equal to 125 psi. Specialty finish applied. 5-year warranty. 5% recycled content. Meets NSF, is CA 1350 compliant and Floor Score Certified. Provide 4" rubber covered base molding – corners and special shapes shall be factory-made (no field bends permitted).
  - iii) Rubber Tile:
    - (1) Class II Laminated A&B (A=Solid Color Wear Layer; B=Mottled Wear Layer). Thickness of 0.080" or greater. 5-year warranty. 0% VOC emissions – CA 1350

compliant. Provide 4" rubber coved base molding – corners and special shapes shall be factory made (no field bends permitted).

iv) Rubber Gym Tile:

- (1) Rubber Tile: High-impact flooring designed for fitness setting. Thickness of 3/8" or greater. 5-year warranty. 0% VOC emissions – CA 1350 compliant. Provide 4" rubber coved base molding – corners and special shapes shall be factory made (no field bends permitted).

v) Seamless Resilient Sheet:

- (1) Seamless Sheet Vinyl: Heterogeneous Type I (Clear Wear Layer 0.020 inches) Type II (Filled Wear Layer 0.050 inches). Static load limit greater than or equal to 175 psi. Specialty topcoat applied. 5-year warranty. 5% recycled/renewable content meets Sustainability NSF332 and is CA 1350 compliant. Manufacturer approved heat welding.
- (2) Extend flooring up wall for 6" base – corners and special shapes shall be purpose-specific and factory-made accessories and sealed to flooring system.

vi) Linoleum:

- (1) Thickness no less than 2.5mm. Static load limit greater than or equal to 150 psi. Factory surface applied. 2-year warranty. 10% recycled/renewable content. 30% minimum binder content. Is VOC emission – CA 1350 compliant. Manufacturer approved heat welding. Extend flooring up wall for 6" base – corners and special shapes shall be purpose-specific and factory-made accessories and sealed to flooring system.

vii) Tile:

- (1) Porcelain Tile: Conforms to ANSI A137.1. Commercial (Abrasion Class IV). Virtuous (P3/E3/O3). Stain and chemical Class
- (2) B or better. 18-month warranty. Tile in toilet and shower rooms shall use non-white, epoxy grout.
- (3) Provide purpose-specific factory-made tile shapes for (minimum 4") base; inside corners; outside corners; etc.

viii) Heavy-duty Tile

- (1) Quarry Tile: Conforms to ANSI A137.1. Commercial (Abrasion Class IV). Virtuous (Class E3). Breaking strength greater than or equal to 350 lbs. Stain and chemical Class B or better. 18-month warranty. Tile at housekeeping rooms shall use non-white, epoxy grout. Provide matching base tile to a minimum of 1'-0" above finished floor.

ix) Concrete Coating

- (1) Above-Grade Parking Deck Coating: Provide a clear, filmless, low solid, penetrating water repellent at horizontal concrete surfaces. Coating shall resist water and chloride ion intrusion, stain damage, freeze/thaw spalling, efflorescence, and rust damage.
- (2) Basis of Design: Themec Dur-A-Pell 20. Provide striping for safety systems, accessibility clearances, lane designations, parking spaces/limits, and door clearance zones as a minimum.

x) Service Bays:

- (1) Provide an 1/8" thick minimum epoxy coating with urethane topcoat system. System shall be self-leveling and protect surface from impact, abrasion, wet conditions, and mild chemicals. Surface preparation shall include thoroughly

cleaning and blasting in accordance with SSPC-SP13/NACE No. 6 Surface Preparation of Concrete prior to application of coating system. Basis of Design: Modified Polyamine Epoxy Tnemec Series 237 PowerTread. with Aliphatic Moisture Cured Urethane Tnemec Series 247 EverThane topcoat. Provide striping as required by the Owner.

## **Structural Design**

- A. The authority having jurisdiction is the City of Glenwood Springs, CO. Glenwood Springs has adopted the International Building Code, 2021 Edition (2021 IBC) with local amendments. The design information, based on the more stringent of the 2021 IBC with Glenwood Springs amendments and ASCE 7-16, is listed in Table 4.1.
- B. The structures fall into Risk Category II and assumes Occupancy A-3 for the assembly areas, B for the business areas, and S-2 for the storage areas.

**Table 4.1: Building Design Information<sup>1</sup>**

| <b>Design Component</b>           | <b>ASCE 7-16 / 2021 IBC</b>                                                            |
|-----------------------------------|----------------------------------------------------------------------------------------|
| <b>Ultimate Design Wind Speed</b> | Risk Category II, wind speed of 115 mph                                                |
| <b>Wind Exposure Category</b>     | C                                                                                      |
| <b>Seismic Design Category</b>    | B                                                                                      |
| <b>Weathering</b>                 | Severe                                                                                 |
| <b>Winter Design Temperature</b>  | -2°F                                                                                   |
| <b>Mean Annual Temperature</b>    | 48° F                                                                                  |
| <b>Snow Load<sup>1</sup></b>      | 50 psf (ground snow load – $p_g$ )<br>31.5 psf (balanced flat roof snow load – $p_f$ ) |
| <b>Frost Line Depth</b>           | 36"                                                                                    |

### Applicable Codes and Standards

Based on the information above the structural design will be based on the following material codes and design loads listed in:

- Table 4.2 - Structural and Building Design Standards
- Table 4.3 – Transit Center Building Design Loads
- Table 4.4 – Transit Center Administration Building Design Loads
- Table 4.5 – Transit Center Storage Building Design Loads

**Table 4.2: Structural and Building Design Codes**



| Design Component        | Code Description                                                                                                                                                                                                                                                 |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Structural Steel</b> | American Institute of Steel Construction<br>(AISC) Steel Construction Manual 16 <sup>th</sup>                                                                                                                                                                    |
| <b>Concrete</b>         | American Concrete Institute (ACI)<br>ACI 318-14 – Building Code Requirements for Structural Concrete, 2014<br>ACI 301-16 – Specifications for Structural Concrete, 2010<br>ACI MCP – Manual of Concrete Practice<br>Precast/Prestressed Concrete Institute (PCI) |
| <b>Masonry</b>          | Building Code Requirements and Specification for Masonry Structures<br>TMS402/602 - 16-                                                                                                                                                                          |
| <b>Wood</b>             | National Design Specification for Wood Construction, 2018                                                                                                                                                                                                        |
| <b>Design Loads</b>     | American Society of Civil Engineers (ASCE)<br>Minimum Design Loads for Buildings and Other Structures, ASCE 7-16                                                                                                                                                 |

## **Phase 6A - Transit Station**

### **A. Design Loads**

**Table 4.3: Transit Station Building Design Loads**

| Design Loads                                             | Value / Description                     |
|----------------------------------------------------------|-----------------------------------------|
| <b>Live Load</b>                                         |                                         |
| Roof, L <sub>r</sub> :                                   | 20 psf (reducible per code)             |
| Floor (Public Areas and Corridors):                      | 100 psf                                 |
| Floor (Storage):                                         | 125 psf                                 |
| <b>Snow Load</b>                                         |                                         |
| Ground Snow Load                                         | 50 psf                                  |
| <i>p<sub>g</sub></i> : Flat Roof, <i>p<sub>f</sub></i> : | 31.5 psf                                |
| Exposure Factor, <i>C<sub>e</sub></i>                    | 0.90 (Fully Exposed)                    |
| : Importance Factor,                                     | 1.00 (Risk Category II)                 |
| <b>Wind Load</b>                                         |                                         |
| Ultimate Wind Speed,                                     | 115 mph (Risk Category II) <sup>1</sup> |
| <i>V<sub>ult</sub></i> : Wind Exposure:                  | C                                       |
| Internal Pressure Coef.                                  | +/- 0.18                                |

|                                             |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>Seismic Loads</b>                        |                                                  |
| <b>Risk Category</b>                        | II                                               |
| <b>Importance Factor, <math>I_e</math>:</b> | 1.0 (Risk Category II)                           |
| <b>Mapped Spectral Response Parameters:</b> | 0.417 g (ATC Hazards by Location)                |
| <b>S</b>                                    | 0.085 g (ATC Hazards by Location)                |
| <b>s</b>                                    | D                                                |
| <b>S</b>                                    |                                                  |
| <b>1</b>                                    |                                                  |
| <b>Site Class:</b>                          | 0.408 g (ATC Hazards by Location)                |
| <b>Design Spectral Response</b>             | 0.136 g (ATC Hazards by Location)                |
| <b>Acceleration Parameters:</b>             | B                                                |
| <b>SD</b>                                   | Light-framed walls (cold-formed                  |
| <b>S</b>                                    | steel) with wood panels                          |
| <b>SD</b>                                   | Light-framed walls (cold-formed steel) with wood |
| <b>1</b>                                    | structural panels                                |
| <b>Seismic Design Category:</b>             | 0.0627                                           |
| <b>Bearing Wall Systems</b>                 | 6.5                                              |

| Design Loads                           | Value / Description                |
|----------------------------------------|------------------------------------|
| <b>Geotechnical Criteria:</b>          |                                    |
| <b>Foundation Type:</b>                | Spread Footers                     |
| <b>Bearing Material:</b>               | Improved Soils and Structural Fill |
| <b>Net Allowable Bearing Pressure:</b> | 4,000 psf                          |

## B. Materials

1. The structural system is expected to be comprised on Light-framed walls (cold-formed steel) with wood panels, structural steel members, and cast in place concrete. The following is a list of assumed materials and properties.
  - i) Concrete: 4,000 psi (minimum) 28-day strength
  - ii) Steel: ASTM A992, A500, A36
  - iii) Wood: Hem-Fir

## C. Framing

1. Roof Framing
  - i) The roof framing is expected to consist of steel beams, supported by exterior load bearing Light-framed walls (cold-formed steel) with wood panels, and interior steel girders and columns, with steel decking.
2. Lateral System
  - i) The lateral system is expected to consist of Light-framed walls (cold-formed steel) with wood structural panels.

## D. Foundations

1. Slab on Grade
  - i) SEH anticipates a slab on grade supported on at least 6 inches of base course.
2. Foundations

- i) Based on the most recent geotechnical report, completed in August of 2023, SEH expects that the building will be supported on shallow, reinforced concrete spread footers bearing on improved soils and structural fill.'

### **Phase 6B - Administration Building**

#### **A. Design Loads**

**Table 4.4: Administration Building Design Loads**

| <b>Design Loads</b>                  | <b>Value / Description</b>              |
|--------------------------------------|-----------------------------------------|
| <b>Live Load</b>                     |                                         |
| Roof, $L_r$ :                        | 20 psf (reducible per code)             |
| Floor (Office Areas):                | 50 psf                                  |
| Floor (Lobby Areas and Corridors):   | 100 psf                                 |
| Floor (Storage):                     | 125 psf                                 |
| <b>Snow Load</b>                     |                                         |
| Ground Snow Load                     | 50 psf                                  |
| $p_g$ : Flat Roof, $p_f$ :           | 31.5 psf                                |
| Exposure Factor, $C_e$               | 0.90 (Fully Exposed)                    |
| : Importance Factor,                 | 1.00 (Risk Category II)                 |
| <b>Wind Load</b>                     |                                         |
| Ultimate Wind Speed,                 | 115 mph (Risk Category II) <sup>1</sup> |
| $V_{ult}$ : Wind Exposure:           | C                                       |
| Internal Pressure Coef.              | +/- 0.18                                |
| <b>Seismic Loads</b>                 |                                         |
| Risk                                 | II                                      |
| Category                             | 1.0 (Risk Category II)                  |
| Importance Factor, $I_e$ :           |                                         |
| Mapped Spectral Response Parameters: | 0.417 g (ATC Hazards by Location)       |
| $S$                                  | 0.085 g (ATC Hazards by Location)       |
| $s$                                  | D                                       |
| $S$                                  |                                         |
| $1$                                  |                                         |
| Site Class:                          | 0.408 g (ATC Hazards by Location)       |
| Design Spectral Response             | 0.136 g (ATC Hazards by Location)       |
| Acceleration Parameters:             | B                                       |
| $SD$                                 | Precast Walls                           |
| $S$                                  | Precast Shear Walls                     |
| $SD$                                 | 0.1359                                  |
| $1$                                  | 3                                       |
| Seismic Design Category:             | Equivalent Lateral Force                |
| Bearing Wall Systems                 |                                         |

| Design Loads                           | Value / Description                |
|----------------------------------------|------------------------------------|
| <b>Geotechnical Criteria:</b>          |                                    |
| <b>Foundation Type:</b>                | Spread Footers                     |
| <b>Bearing Material:</b>               | Improved Soils and Structural Fill |
| <b>Net Allowable Bearing Pressure:</b> | 4,000 psf                          |
|                                        |                                    |

## **B. Materials**

1. The structural system is expected to be comprised on precast walls, structural steel members, and cast in place concrete. The following is a list of assumed materials and properties.
  - a. Concrete: 4,000 psi (minimum) 28-day strength
  - b. Steel: ASTM A992, A500, A36

## **C. Framing**

1. Roof Framing
  - i) The roof framing is expected to consist of steel beams, supported by exterior load bearing precast walls, and interior steel girders and columns, with steel decking.
2. Floor Framing
3. The floor framing is expected to consist of steel beams, supported by exterior load bearing precast walls, and interior steel girders and columns, with composite steel decking.
4. Lateral System
  - i) The lateral system is expected to consist of precast shear walls.

## **D. Foundations**

1. Slab on Grade
  - i) SEH anticipates a slab on grade supported on at least 6 inches of base course.

## **E. Foundations**

1. Based on the most recent geotechnical report, completed in August of 2023, SEH expects that the building will be supported on shallow, reinforced concrete spread footers bearing on improved soils and structural fill.

## **F. Retaining Walls**

1. The retaining walls adjacent to the building are expected to consist of reinforced concrete.

## **G. Pedestrian Bridge**

1. The pedestrian bridge adjacent to the building is expected to be a pre-engineered truss bridge supported by reinforced concrete abutments.

## **Mechanical Design**

### **Phase 6A - Transit Station**

## **A. Project Description**

1. Mechanical, Electrical, Plumbing and Fire Protection design of the new BRT Station will meet the following criteria. This criteria outlines proposed systems for the BRT Station and represents a general overview of the design approach. Code compliant systems will

be designed and installed to include acceptance and approval from the proper Authorities Having Jurisdiction (AHJ).

## **B. Fire Protection**

1. Code Compliance
  - i) Applicable Local and State Building and Fire Codes and Amendments
  - ii) NFPA 13 Standard for the Installation of Sprinkler Systems
  - iii) Owner Standards and Requirements
2. Incoming Fire Service Main
  - i) The water-based fire suppression system will be served from a new combined fire and domestic water service main supplied by an existing municipal water main. Incoming fire service main will be located in a designated water entry area on the first floor. Connection to the city water main will be by the Civil Contractor. The sprinkler system and Fire Sprinkler Contractor work will begin at the point of connection at the flange inside the building. Hydrant flow tests of the municipal water main will be required and coordinated with the water purveyor to ensure adequate capacity at the site.
  - ii) Reference hydrant flow data will be provided by the water purveyor and sizing of the main and associated fire sprinkler systems will be based on those pressures and flows. Hydrant flow data will indicate whether a fire pump is required to provide the necessary pressures and flows to protect all areas of the facility.
  - iii) Backflow prevention devices will be designed and installed per the requirements of the AHJ. A Fire Department Connection (FDC) will be provided. Location of FDC will be at designated water entry area near sprinkler risers or in nearby location approved by the AHJ. FDC type and specifications will be coordinated with requirements of the AHJ.
3. Automatic Sprinkler System
  - i) An automatic fire sprinkler system will be provided and installed in all spaces of the building except those areas where sprinkler omission is permitted by the standard and fire code.
  - ii) Sprinkler main and branch piping sizes will be hydraulically calculated by the Fire Protection Contractor in accordance with NFPA 13.
  - iii) The sprinkler system will be a wet-pipe type system. It will be zoned based on space usage and hazards as defined by the occupancy type. The BRT Station will be primarily Group S-2 and Group B occupancy. Each zone will be provided a control valve assembly with isolation valve, tamper switch, flow switch, and all other required appurtenances. Control assemblies will be located in the water entry area or at locations approved by the Architect and Owner.
  - iv) Quick response type sprinklers will be installed throughout the building. Recessed style sprinklers will be installed in all areas with a finished ceiling. Standard upright style sprinklers will be installed in all areas without a finished ceiling. All sprinklers installed in areas where they may be subject to mechanical damage will be provided with standard protective guards. All sprinkler styles and finishes will be approved by the Owner and Architect prior to installation.
  - v) Sprinkler spacing and locations will be in accordance with the requirements of NFPA 13. Offices, restrooms, and common spaces will be provided with sprinkler protection in accordance with the requirements for Light Hazard occupancies per NFPA 13.A main sprinkler drain will be provided for the sprinkler systems. The main sprinkler

drain will discharge to a floor drain or to the exterior of the building in a location approved by the Owner and AHJ. A single air vent will be provided for each sprinkler zone.

- vi) All piping shall be new and conform to the requirements of NFPA 13. Fire sprinkler system piping material for all wet-pipe systems will be black steel conforming to ASTM A53, A795 or A135. Schedule 40 piping with threaded fittings will be installed for piping 2 inches in diameter and smaller. Schedule 10 piping with grooved fittings will be installed for piping 2 ½ inches and larger. Schedule 5 piping is not permitted. CPVC piping systems may be used in lieu of black steel if CPVC piping system is only installed in locations approved by the manufacturer.
- 4. Commercial Cooking Operations
  - i) No commercial kitchen equipment or Type I hoods are anticipated as part of the design of the facility. Therefore, no automatic fire extinguishing system interlocked with the Type I hood is required.
- 5. Design and Calculation
  - i) The Fire Sprinkler Contractor will be the Engineer of Record for the sprinkler system. The design and engineering of the system will be by the Fire Sprinkler Contractor. Hydraulic calculations and shop drawings will be performed and calculated by the Contractor. Per NFPA 13, the water supply information utilized for the performance of the hydraulic calculations shall be dated within one year of system installation. These shop drawings and calculations are required to be signed and stamped by a Professional Engineer registered in the State of Colorado or signed and certified by a minimum Level IV Senior Engineering Technician of the National Institute for Certification of Engineering Technology (NICET) practicing in the Fire Protection Field. The signed shop drawings will certify that the fire sprinkler system has been hydraulically calculated in compliance with NFPA and governing codes. The signing party is required to be familiar with this type of installation and have previous similar experience.

### **C. Heating, Ventilation, and Air Conditioning**

- 1. Code Compliance
  - i) Applicable Local and State Building, Mechanical, Energy Conservation, Plumbing, Fire and Fuel Gas Codes and Amendments
  - ii) NFPA 70 National Electrical Code
  - iii) ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality
  - iv) ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
  - v) Owner Standards and Requirements
- 2. Mechanical Design Information
  - i) Location: Glenwood Springs, CO
  - ii) Climate Zone: 5B
  - iii) Elevation: 5,761 ft above sea level
  - iv) Summer Outside Air Conditions: 95.1 deg F / 58.9 deg F (DB/WB)
  - v) Summer Indoor Conditions: 75 deg F, 60% RH
  - vi) Winter Outside Air Conditions: -0.2 deg F (DB)
  - vii) Winter Indoor Conditions: 72 deg F
  - viii) Ventilation Rate: ASHRAE 62.1
- 3. Mechanical Systems Information



- i) The building will be ventilated and conditioned using various independent HVAC systems. Below are the anticipated systems required:
  - (1) Ground Source Heat Pump
    - (a) A central ground source heat pump (GSHP) system will serve all hydronic heating and cooling equipment in the facility. The GSHP system will include a vertical loop array located below the parking long adjacent to the facility. GSHP equipment will be located in the mechanical room. The GSHP plant equipment will include manifolds, piping, pumps, staged compressor water source heat pump, heat exchanger, and associated accessories, sensors, controls, and valving. The heating water system shall serve air handling units, energy recovery ventilators, terminal boxes and radiant floor snowmelt system.
  - (2) Snowmelt System
    - (a) A radiant slab snowmelt system will be provided to prevent snow and ice accumulation at the North Bay entrances of each fire station. Each snowmelt system will consist of a dedicated condensing wall-mounted boiler that provide hydronic heating to snowmelt loops embedded in the driveway apron concrete.
  - (3) Air Handling Equipment
    - (a) A variable air volume air handling unit with terminal boxes equipped with reheat coils will be provided to serve the common areas, offices, restrooms, and storage rooms. Hydronic heating and cooling at the AHU and terminal boxes via coils fed by the ground source heat pump plant.
  - (4) Ventilation
    - (a) Restrooms and showers throughout the facility will be provided with code required dedicated exhaust fans. Exhaust fans will be switched to turn on/off with the lights. The design and construction shall provide sufficient ventilation to obtain acceptable air quality, determined using the Ventilation Rate Procedure of ANSI/ASHRAE 62.1.
  - (5) Data Equipment Room
    - (a) A computer room air conditioning (CRAC) unit will be provided to serve the data equipment room.
- 4. Testing, Balancing, and Commissioning
  - i) All air systems will be tested and adjusted by a NEBB or TABB certified contractor. HVAC and Hydronic systems will be commissioned to ensure they operate as intended and meet the required conditioning and ventilation setpoints.
- 5. Controls
  - i) HVAC systems will each be provided with their own thermostat located within the conditioned area.
  - ii) A central building management system (BMS) will be provided for the facility. The BMS will control, monitor, and trend space temperatures, setpoints, lighting, and building energy consumption. The system will be a full DDC, internet accessible control system with all new equipment included.
- 6. Remote Access
  - i) Remote access to the BMS will be provided via web-based interface. Remote access will have, at a minimum, the following levels of control capability based on credentials provided during log-in:

- (1) View Only Access: No adjustment capability.
  - (2) Operator Access: Similar level of control to that available via the operator workstation interface. Override default setpoint values
  - (3) Technician Access: Full control, troubleshooting, adjustment, and programming capabilities. Change default setpoint values.
7. Trending
- i) All trending will be shown graphically for a user adjustable time period. Data will be exportable to Microsoft Excel. The following is a list of the minimum points that will be trended for at least 13 months. All other points will be trended for 4 weeks:
    - (1) Outside Air Temperature
    - (2) Alarms – Equipment, Code, Time
    - (3) All Temperature Sensors – Every 5 minute interval, max.
    - (4) Fan/Motor Speed – Every 5 minute interval, max.
8. Graphics
- i) All BMS points will be represented by graphic display on the web-based interface. Graphical floor plans will indicate zone designations as well as space temperature setpoints and space temperature. Background color of zones will be changed as follows:
    - (1) None: Space Temperature is within +/- 3 deg of setpoint
    - (2) Red: Space Temperature is greater than 4 deg above setpoint
    - (3) Blue: Space Temperature is less than 4 deg below setpoint
9. Adjustability
- i) All setpoints and parameters will be independently adjustable and clearly identified as setpoints and not read only values. The occupancy mode (occupied or unoccupied) will be determined through a user-adjustable, graphical, seven-day schedule with a holiday schedule. A single point software command feature will be provided for each of the major systems to reset all overridden variables back to default values. All default values will be automatically indicated adjacent to any value that has been overridden.
10. Alarms
- i) All manufacturer's alarms will be reported to the BMS. Alarms will include:
    - (1) Equipment common alarms
    - (2) Status / Equipment failure
    - (3) Room Temperature > 5deg F +/- from setpoint
    - (4) Fan failure by AFMS
    - (5) Dirty Filter by differential pressure sensor above setpoint
  - ii) User-adjustable dial-out alarming capability will be provided to destination (via text message / email / other). The quantity of unique dial-out alarm codes available to the operator will be equal to at least the quantity of points within the system. The initial dial-out alarm setpoints will be:
    - (1) Generalized equipment failure.
    - (2) Generalized space temperature low limit (for any monitored space)
    - (3) Generalized space temperature high limit (for any monitored space)
11. Energy Management
- i) Demand-limiting programs and optimum start/stop programs will be considered for HVAC systems and included in the controls, as necessary.

#### **D. Plumbing**

1. Code Compliance
  - i) Applicable Local and State Building, Plumbing, Energy Conservation, Fire and Fuel Gas Codes and Amendments
  - ii) Owner Standards and Requirements
2. Plumbing Fixture Flow Rate Information
  - i) The plumbing fixture flow rates will meet EPA Watersense requirements and shall not exceed:
    - (1) Water closets: 1.28 gallons per flush
    - (2) Lavatory faucets: 1.5 gallons per minute
    - (3) Sink faucets: 1.5 gallons per minute
    - (4) Shower heads: 2.0 gallons per minute
3. General Plumbing Fixture and System Information
  - (1) Domestic water piping, faucets, valves, and associated equipment will be lead-free Domestic water piping, faucets, valves, and associated equipment will be lead-free.
  - (2) Isolation valves will be provided on all branch piping. These branches will be provided for each group of plumbing fixtures, each piece of equipment, or area requiring water service.
  - (3) Floor drains will be provided in restrooms.
  - (4) Floor drains will be provided in mechanical rooms and for equipment requiring drainage.
  - (5) Floor drains will have trap seal devices, ASSE 1072 listed.
  - (6) Water hammer arrestors will be provided on all water piping branches serving flush valve fixtures and equipment with solenoid valves such as clothes washers.
  - (7) Freeze-proof wall hydrants will be provided at the exterior of the building space as requested by the Owner.
  - (8) Building unit fixtures will be approved by the Architect and Owner.
  - (9) Public and private toilet room flush valves will be standard lever type activation.
  - (10) All ADA lavatory waste piping and water supplies will be insulated with commercial grade insulation kits.
  - (11) All floor mounted equipment will be mounted on housekeeping pads.
  - ii) The following fixtures are anticipated in the design:
    - (1) Driver Lounge
      - (a) Two-deep-compartment sink – high clearance faucet with wrist-blades, garbage disposal
      - (b) Dishwasher
      - (c) Coffee-maker
      - (d) Refrigerator with ice maker
    - (2) Driver Restroom
      - (a) Water Closet – flush valve, elongated bowl, split seat, ADA
      - (b) Lavatory – standard faucet, wrist blade handles
      - (c) Floor drain
    - (3) Public Restroom
      - (a) Water Closet – flush valve, elongated bowl, split seat, ADA
      - (b) Lavatory – standard faucet, wrist blade handles
      - (c) Floor drain
    - (4) Station Lobby

- (a) Drinking Fountain
- (5) Janitor
  - (a) Mop Sink
  - (b) Floor drain
- 4. Domestic Water
  - i) Building will require a new water service and meter. Backflow prevention devices, as well as pressure regulating devices will be installed as required by the AHJ.
  - ii) Domestic water service will enter the building as a combined fire and domestic service.
  - iii) A centralized hot water heater and circulation system will be installed to provide hot water to fixtures. The water heating system will be fed by the ground source heat pump plant and stored in a hot water storage tank. Tempered water will be delivered to all public hand-washing stations through point-of-use ASSE 1070 mixing valves, this includes hand washing sinks in the kitchen area. One mixing valve may serve multiple side by side fixtures. Where public faucets have a hot and cold supply the temperature downstream of the mixing valve will be set at 110 deg F maximum.
  - iv) Domestic water distribution piping may be PEX piping if it meets code requirements and is only installed in locations approved by the manufacturer.
- 5. Irrigation
  - i) A separate backflow prevention device and main will be provided to supply site irrigation systems. Piping and appurtenances will be sized for 20 gallons per minute demand.
- 6. Sanitary Waste and Vent
  - i) Sanitary waste and vent system will be a conventional system.
  - ii) Throughout the building there will be sanitary risers and vent stacks. The stacks will be located as strategically as possible to minimize the quantity required. Termination of vent stacks will require special attention so the odor does not affect air intake locations.
- 7. Storm Drainage
  - i) Storm drain piping will terminate below grade and discharge to nearest storm water system.
  - ii) Overflow drain piping will terminate above grade at a downspout nozzle. The building will have separate storm and overflow systems. The storm and overflow drain systems will be based on rainfall rates as outlined in governing codes and requirements.
- 8. Natural Gas Piping
  - i) This building will not have a natural gas service. All appliances and equipment will be electric.

## **Phase 6B - Administration Building**

### **A. Project Description**

1. Mechanical, Electrical, Plumbing and Fire Protection design of the new administration building will meet the following criteria. This criteria outlines proposed systems for the administration building and represents a general overview of the design approach. Code compliant systems will be designed and installed to include acceptance and approval from the proper Authorities Having Jurisdiction (AHJ).

### **B. Fire Protection**

1. Code Compliance
  - i) Applicable Local and State Building and Fire Codes and Amendments
  - ii) NFPA 13 Standard for the Installation of Sprinkler Systems
  - iii) Owner Standards and Requirements
2. Incoming Fire Service Main
  - i) The water-based fire suppression system will be served from a new combined fire and domestic water service main supplied by an existing municipal water main. Incoming fire service main will be located in a designated water entry area on the first floor. Connection to the city water main will be by the Civil Contractor. The sprinkler system and Fire Sprinkler Contractor work will begin at the point of connection at the flange inside the building. Hydrant flow tests of the municipal water main will be required and coordinated with the water purveyor to ensure adequate capacity at the site.
  - ii) Reference hydrant flow data will be provided by the water purveyor and sizing of the main and associated fire sprinkler systems will be based on those pressures and flows. Hydrant flow data will indicate whether a fire pump is required to provide the necessary pressures and flows to protect all areas of the facility.
  - iii) Backflow prevention devices will be designed and installed per the requirements of the AHJ. A Fire Department Connection (FDC) will be provided. Location of FDC will be at designated water entry area near sprinkler risers or in nearby location approved by the AHJ. FDC type and specifications will be coordinated with requirements of the AHJ.
3. Automatic Sprinkler System
  - i) An automatic fire sprinkler system will be provided and installed in all spaces of the building except those areas where sprinkler omission is permitted by the standard and fire code.
  - ii) Sprinkler main and branch piping sizes will be hydraulically calculated by the Fire Protection Contractor in accordance with NFPA 13.
  - iii) The sprinkler system will be a wet-pipe type system. It will be zoned based on space usage and hazards as defined by the occupancy type. The administration building will be primarily Group S-2 and Group B occupancy. Each zone will be provided a control valve assembly with isolation valve, tamper switch, flow switch, and all other required appurtenances. Control assemblies will be located in the water entry area or at locations approved by the Architect and Owner.
  - iv) Quick response type sprinklers will be installed throughout the building. Recessed style sprinklers will be installed in all areas with a finished ceiling. Standard upright style sprinklers will be installed in all areas without a finished ceiling. All sprinklers installed in areas where they may be subject to mechanical damage will be provided with standard protective guards. All sprinkler styles and finishes will be approved by the Owner and Architect prior to installation.
  - v) Sprinkler spacing and locations will be in accordance with the requirements of NFPA 13. Offices, restrooms, and common spaces will be provided with sprinkler protection in accordance with the requirements for Light Hazard occupancies per NFPA 13.
  - vi) A main sprinkler drain will be provided for the sprinkler systems. The main sprinkler drain will discharge to a floor drain or to the exterior of the building in a location approved by the Owner and AHJ. A single air vent will be provided for each sprinkler zone.

- vii) All piping shall be new and conform to the requirements of NFPA 13. Fire sprinkler system piping material for all wet-pipe systems will be black steel conforming to ASTM A53, A795 or A135. Schedule 40 piping with threaded fittings will be installed for piping 2 inches in diameter and smaller. Schedule 10 piping with grooved fittings will be installed for piping 2 ½ inches and larger. Schedule 5 piping is not permitted. CPVC piping systems may be used in lieu of black steel if CPVC piping system is only installed in locations approved by the manufacturer.
- 4. Commercial Cooking Operations
  - i) No commercial kitchen equipment or Type I hoods are anticipated as part of the design of the facility. Therefore, no automatic fire extinguishing system interlocked with the Type I hood is required.
- 5. Design and Calculation
  - i) The Fire Sprinkler Contractor will be the Engineer of Record for the sprinkler system. The design and engineering of the system will be by the Fire Sprinkler Contractor. Hydraulic calculations and shop drawings will be performed and calculated by the Contractor. Per NFPA 13, the water supply information utilized for the performance of the hydraulic calculations shall be dated within one year of system installation. These shop drawings and calculations are required to be signed and stamped by a Professional Engineer registered in the State of Colorado or signed and certified by a minimum Level IV Senior Engineering Technician of the National Institute for Certification of Engineering Technology (NICET) practicing in the Fire Protection Field. The signed shop drawings will certify that the fire sprinkler system has been hydraulically calculated in compliance with NFPA and governing codes. The signing party is required to be familiar with this type of installation and have previous similar experience.

### **C. Heating, Ventilation, and Air Conditioning**

- 1. Code Compliance
  - i) Applicable Local and State Building, Mechanical, Energy Conservation, Plumbing, Fire and Fuel Gas Codes and Amendments
  - ii) NFPA 70 National Electrical Code
  - iii) ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality
  - iv) ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
  - v) Owner Standards and Requirements
- 2. Mechanical Design Information
  - i) Location: Glenwood Springs, CO
  - ii) Climate Zone: 5B
  - iii) Elevation: 5,761 ft above sea level
  - iv) Summer Outside Air Conditions: 95.1 deg F / 58.9 deg F (DB/WB)
  - v) Summer Indoor Conditions: 75 deg F, 60% RH
  - vi) Winter Outside Air Conditions: -0.2 deg F (DB)
  - vii) Winter Indoor Conditions: 72 deg F
  - viii) Ventilation Rate: ASHRAE 62.1
- 3. Mechanical Systems Information
  - i) The building will be ventilated and conditioned using various independent HVAC systems. Below are the anticipated systems required:
    - (1) Air Handling Equipment



- (a) Packaged rooftop units and terminal reheat boxes will provide heating and cooling to each zone. Each zone will be served by a terminal reheat box located above the ceiling and controlled by a thermostat located in the space. The primary energy source will be natural gas heating and DX cooling.
- (2) Ventilation
  - (a) Restrooms and showers throughout the facility will be provided with code required dedicated exhaust fans. Exhaust fans will be switched to turn on/off with the lights. The design and construction shall provide sufficient ventilation to obtain acceptable air quality, determined using the Ventilation Rate Procedure of ANSI/ASHRAE 62.1.
- (3) Data Equipment Rooms
  - (a) A computer room air conditioning (CRAC) unit will be provided to serve data equipment rooms.
- 4. Testing, Balancing, and Commissioning
  - i) All air systems will be tested and adjusted by a NEBB or TABB certified contractor. HVAC and Hydronic systems will be commissioned to ensure they operate as intended and meet the required conditioning and ventilation setpoints.
- 5. Controls
  - i) HVAC systems will each be provided with their own thermostat located within the conditioned area.
  - ii) A central building management system (BMS) will be provided for the facility. The BMS will control, monitor, and trend space temperatures, setpoints, lighting, and building energy consumption. The system will be a full DDC, internet accessible control system with all new equipment included.
- 6. Remote Access
  - i) Remote access to the BMS will be provided via web-based interface. Remote access will have, at a minimum, the following levels of control capability based on credentials provided during log-in:
    - (1) View Only Access: No adjustment capability.
    - (2) Operator Access: Similar level of control to that available via the operator workstation interface. Override default setpoint values
    - (3) Technician Access: Full control, troubleshooting, adjustment, and programming capabilities. Change default setpoint values.
- 7. Trending
  - i) All trending will be shown graphically for a user adjustable time period. Data will be exportable to Microsoft Excel. The following is a list of the minimum points that will be trended for at least 13 months. All other points will be trended for 4 weeks:
    - (1) Outside Air Temperature
    - (2) Alarms – Equipment, Code, Time
    - (3) All Temperature Sensors – Every 5 minute interval, max.
    - (4) Fan/Motor Speed – Every 5 minute interval, max.
- 8. Graphics
  - i) All BMS points will be represented by graphic display on the web-based interface. Graphical floor plans will indicate zone designations as well as space temperature setpoints and space temperature. Background color of zones will be changed as follows:
    - (1) None: Space Temperature is within +/- 3 deg of setpoint

- (2) Red: Space Temperature is greater than 4 deg above setpoint
  - (3) Blue: Space Temperature is less than 4 deg below setpoint
- 9. Adjustability
  - i) All setpoints and parameters will be independently adjustable and clearly identified as setpoints and not read only values. The occupancy mode (occupied or unoccupied) will be determined through a user-adjustable, graphical, seven-day schedule with a holiday schedule. A single point software command feature will be provided for each of the major systems to reset all overridden variables back to default values. All default values will be automatically indicated adjacent to any value that has been overridden.
- 10. Alarms
  - i) All manufacturer's alarms will be reported to the BMS. Alarms will include:
    - (1) Equipment common alarms
    - (2) Status / Equipment failure
    - (3) Room Temperature > 5deg F +/- from setpoint
    - (4) Fan failure by AFMS
    - (5) Dirty Filter by differential pressure sensor above setpoint
- 11. User-adjustable dial-out alarming capability will be provided to destination (via text message / email / other). The quantity of unique dial-out alarm codes available to the operator will be equal to at least the quantity of points within the system. The initial dial-out alarm setpoints will be:
  - (1) Generalized equipment failure.
  - (2) Generalized space temperature low limit (for any monitored space)
  - (3) Generalized space temperature high limit (for any monitored space)
- 12. Energy Management
- 13. Demand-limiting programs and optimum start/stop programs will be considered for HVAC systems and included in the controls, as necessary.

#### **D. Plumbing**

- 1. Code Compliance
  - i) Applicable Local and State Building, Plumbing, Energy Conservation, Fire and Fuel Gas Codes and Amendments
  - ii) Owner Standards and Requirements
- 2. Plumbing Fixture Flow Rate Information
  - i) The plumbing fixture flow rates will meet EPA Watersense requirements and shall not exceed:
    - (1) Water closets: 1.28 gallons per flush
    - (2) Lavatory faucets: 1.5 gallons per minute
    - (3) Sink faucets: 1.5 gallons per minute
    - (4) Shower heads: 2.0 gallons per minute
  - ii) General Plumbing Fixture and System Information
    - (1) Domestic water piping, faucets, valves, and associated equipment will be lead-free Domestic water piping, faucets, valves, and associated equipment will be lead-free.
    - (2) Isolation valves will be provided on all branch piping. These branches will be provided for each group of plumbing fixtures, each piece of equipment, or area requiring water service.
    - (3) Floor drains will be provided in restrooms.

- (4) Floor drains will be provided in mechanical rooms and for equipment requiring drainage.
- (5) Floor drains will have trap seal devices, ASSE 1072 listed.
- (6) Water hammer arrestors will be provided on all water piping branches serving flush valve fixtures and equipment with solenoid valves such as clothes washers.
- (7) Freeze-proof wall hydrants will be provided at the exterior of the building space as requested by the Owner.
- (8) Building unit fixtures will be approved by the Architect and Owner.
- (9) Public and private toilet room flush valves will be standard lever type activation.
- (10) All ADA lavatory waste piping and water supplies will be insulated with commercial grade insulation kits.
- (11) All floor mounted equipment will be mounted on housekeeping pads.
- iii) The following fixtures are anticipated in the design:
  - (1) Kitchenette
    - (a) Two-deep-compartment sink – high clearance faucet with wrist-blades, garbage disposal
    - (b) Dishwasher
    - (c) Coffee-maker
    - (d) Refrigerator with ice maker
  - (2) Public Restroom
    - (a) Water Closet – flush valve, elongated bowl, split seat, ADA
    - (b) Lavatory – standard faucet, wrist blade handles
    - (c) Floor drain
  - (3) Lobby
    - (a) Drinking Fountain
  - (4) Janitor
    - (a) Mop Sink
    - (b) Floor drain
  - (5) Water Entry
    - (a) Floor drain
- 3. Domestic Water
  - i) Building will require a new water service and meter. Backflow prevention devices, as well as pressure regulating devices will be installed as required by the AHJ.
  - ii) Domestic water service will enter the building as a combined fire and domestic service.
  - iii) A centralized hot water heater and circulation system will be installed to provide hot water to fixtures. The water heating system will employ natural gas as the heating media. Tempered water will be delivered to all public hand-washing stations through point-of-use ASSE 1070 mixing valves, this includes hand washing sinks in the kitchen area. One mixing valve may serve multiple side by side fixtures. Where public faucets have a hot and cold supply the temperature downstream of the mixing valve will be set at 110 deg F maximum.
  - iv) Domestic water distribution piping may be PEX piping if it meets code requirements and is only installed in locations approved by the manufacturer.
- 4. Irrigation

- i) A separate backflow prevention device and main will be provided to supply site irrigation systems. Piping and appurtenances will be sized for 20 gallons per minute demand.
- 5. Sanitary Waste and Vent
  - i) Sanitary waste and vent system will be a conventional system.
  - ii) Throughout the building there will be sanitary risers and vent stacks. The stacks will be located as strategically as possible to minimize the quantity required. Termination of vent stacks will require special attention so the odor does not affect air intake locations.
- 6. Storm Drainage
  - i) Storm drain piping will terminate below grade and discharge to nearest storm water system.
  - ii) Overflow drain piping will terminate above grade at a downspout nozzle. The building will have separate storm and overflow systems. The storm and overflow drain systems will be based on rainfall rates as outlined in governing codes and requirements.
- 7. Natural Gas Piping
  - i) This building will not have a natural gas service. All appliances and equipment will be electric.

## **Phase 8 - Storage Building**

### **A. Project Description**

- 1. Mechanical, Electrical, Plumbing and Fire Protection design of the new administration building will meet the following criteria. This criteria outlines proposed systems for the administration building and represents a general overview of the design approach. Code compliant systems will be designed and installed to include acceptance and approval from the proper Authorities Having Jurisdiction (AHJ).

### **B. Fire Protection**

- 1. No fire protection equipment or sprinkler system are anticipated as part of the design of the facility.

### **C. Heating, Ventilation, and Air Conditioning**

- 1. Code Compliance
  - i) Applicable Local and State Building, Mechanical, Energy Conservation, Plumbing, Fire and Fuel Gas Codes and Amendments
  - ii) NFPA 70 National Electrical Code
  - iii) ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality
  - iv) ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
  - v) Owner Standards and Requirements
- 2. Mechanical Design Information
  - i) Location: Glenwood Springs, CO
  - ii) Climate Zone: 5B
  - iii) Elevation: 5,761 ft above sea level
  - iv) Summer Outside Air Conditions: 95.1 deg F / 58.9 deg F (DB/WB)
  - v) Summer Indoor Conditions: 75 deg F, 60% RH
  - vi) Winter Outside Air Conditions: -0.2 deg F (DB)
  - vii) Winter Indoor Conditions: 72 deg F

- viii) Ventilation Rate: ASHRAE 62.1
3. Mechanical Systems Information
- i) The building will be ventilated and conditioned using various independent HVAC systems. Below are the anticipated systems required:
  - ii) Unit Heaters
    - (1) Electric unit heaters will provide heating to the maintenance building. The unit heaters will be controlled by a thermostat located in the space. The primary energy source will be electric heating.
  - iii) Ventilation
    - (1) Facility will be provided with code required dedicated exhaust fans. Exhaust fans will be interlocked with CO sensors to meet code required rates for vehicle maintenance bays. The design and construction shall provide sufficient ventilation to obtain acceptable air quality, determined using the Ventilation Rate Procedure of ANSI/ASHRAE 62.1.
4. Testing, Balancing, and Commissioning
- i) All air systems will be tested and adjusted by a NEBB or TABB certified contractor. HVAC systems will be commissioned to ensure they operate as intended and meet the required conditioning and ventilation setpoints.
5. Controls
- i) The maintenance building electric unit heaters will be provided with thermostat and timing controls.
  - ii) Gas monitoring sensors will control the exhaust fan system as well as a manual override. Sensors will be dual element and will detect air quality to maintain permissible pollutant/contaminant ppm levels. Sensor coverage is approximately 5,000 sqft.

#### **D. Plumbing**

1. Code Compliance
- i) Applicable Local and State Building, Plumbing, Energy Conservation, Fire and Fuel Gas Codes and Amendments
  - ii) Owner Standards and Requirements
2. General Plumbing Fixture and System Information
- i) Trench drains will be provided in the vehicle maintenance bays.
  - ii) Building unit fixtures will be approved by the Architect and Owner.
3. Domestic Water
- i) No domestic water system is anticipated as part of the design of the facility.
4. Irrigation
- i) No irrigation water system is anticipated as part of the design of the facility.
5. Sanitary Waste and Vent
- i) Sanitary waste and vent system will be a conventional system.
6. Storm Drainage
- i) Storm drain piping will terminate below grade and discharge to nearest storm water system.
  - ii) Overflow drain piping will terminate above grade at a downspout nozzle. The building will have a primary storm systems. The storm drain system will be based on rainfall rates as outlined in governing codes and requirements.
7. Natural Gas Piping

- i) This building will not have a natural gas service. All appliances and equipment will be electric.

## **Electrical Design**

### **A. Project Description**

1. The electrical narrative identifies the systems criteria to be used in the development of the construction cost estimates. The use is not intended to cover all systems in their entirety, but to be used as a guide and basis for which the electrical systems will be designed. See other discipline narratives for additional information about project scope and equipment. All work shall be executed in accordance with local and state codes, and latest editions of IBC, NEC, NFPA and ADA.

## **Phase 6A - Transit Station**

### **A. Normal Power**

1. The size of the service, based on the building size of 3,173 square feet, will be 400 amps at 120/208 volts.
  - i) Rough-in for four passenger vehicle charging stations shall be provided.
2. Two bus fast-charging stations will be located adjacent to and west of the Transit Station. Each bus charging station will have a separate utility service meter. Each charging station service size will be 800 amps at 277/480 volts. The distribution switchboards will be located next to the charging stations and will be NEMA 3R rated. Space for a third bus fast-charging station will be included.

### **B. Emergency Power**

1. Emergency power for lighting will utilize battery backup.
2. A 60-amp 4-pole transfer switch will be provided for emergency power. A feeder from the Phase 6B admin building generator set shall be provided. Control wiring between the Transit Center transfer switch and Admin generator shall be provided.

### **C. Uninterruptible Power Supply**

1. Uninterruptible Power Supply (UPS) system(s) shall be provided for equipment located in the MDF and IDF rooms. UPS shall be rack mountable in a standard 19" 4-post server rack.
2. Battery system shall be sized for a minimum of fifteen minutes of backup supply.

### **D. Power Distribution**

1. Separate panelboards for lighting, HVAC, and receptacle power will be required.
  - i) All panelboards/switchboards will be located in the electrical room.
  - ii) Panelboards shall have minimum 30% spare capacity and will have copper bussing.
  - iii) TVSS will be provided for all main panels and switchboards.
  - iv) Surge protection shall be provided on main panelboards.
  - v) Arc flash labeling for distribution equipment shall be provided.
  - vi) Lamecoid labeling will be required for panels and equipment with labeling information per NEC.
  - vii) Arc Flash analysis shall be provided by the contractor.
  - viii) Provide Owner submetering as required by code. The meters shall be digital and capable of monitoring 3-phases independently and overall, for maximum, peak, average, and RMS of the following: amperes, voltages, power factor, volt-amps, wattage and kVar. The system shall be capable of recording these values for a period of not less than 30 days continuously and shall also generate a legible report.



The metering system shall be networked together with a Main PC and shall be located in the Owners designated area. Energy usage shall be reported on a graphical interface as required by code.

2. Commissioning for generator, transfer switches, switchboards, grounding systems, connections, and lighting controls shall be provided.
3. Provide local disconnect switches for mechanical equipment. Mechanical equipment shall be coordinated to meet the available fault current.
4. All interior building conductors shall be installed in conduit and shall be of the following types: electrical metallic tubing (EMT), intermediate metal conduit (IMC), or galvanized rigid conduit (GRC), unless otherwise noted.
5. Provide compression fittings on EMT conduits. Flexible steel conduit shall be utilized for equipment connections in dry areas and liquid-tight conduit shall be utilized in areas subject to moisture unless otherwise noted.
6. Exterior conduit installed underground shall be schedule 40 PVC with PVC Coated GRC elbows.
7. Armored (AC) and Metal Clad (MC), cable shall be acceptable for use in this facility where concealed within wall and ceiling cavities. All homerun circuitry to panelboards shall be installed in conduit.

#### **E. Devices and Outlets**

1. Building standard general-purpose receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R.
2. Floor outlets are required in conference rooms and open space areas.
3. Ground Fault Circuit Interrupter (GFCI) receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R, and isolated ground, computer grade receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R.
4. Provide compression-type two-hole connections on all panel board, transformer, ground bus, switchboard, and switchgear conductor connections. Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the conductor.
5. Private offices shall be provided with two (2) wall mounted fourplex receptacles or four (4) duplex outlets as a minimum. Where printers may be identified to be installed in offices, provide a dedicated duplex at the printer location and branch circuiting shall accommodate two (2) printers per 20A branch circuit.
6. MDF Room shall have one standard duplex receptacle on each of the "short" walls and two standard duplex receptacles on each of the "long" walls. In addition, provide dedicated 20A branch circuits wherever necessary for the special telecom equipment in this room.
7. MDF room to have one (1) fourplex receptacle supplied from a dedicated circuit mounted at 7'-0" above finished floor and one (1) standard duplex receptacle shall be provided on each wall of IDF Rooms. One of the dedicated fourplex receptacles shall be mounted on the plywood backboard at 7'-0" above finished floor. The standard duplex receptacles shall be mounted at 18" above finished floor.
8. Provide a 4" x 1/4" x 12" (minimum length) grounding bar in the MDF room. These ground plates shall be interconnected by a #2 AWG copper conductor and shall connect to the main service grounding electrode system.

## **F. Interior Lighting**

1. All lighting shall be LED with a minimum CRI of 80 and a color temperature of 35k.
2. The IDF Room shall be provided with strip type luminaires with reflectors having 10% up-light and arranged perpendicular to the Telecom equipment to equally illuminate front and back of equipment racks.
3. Public spaces and lobby areas shall have decorative lighting with downlights and accent lighting.
4. Enclosed offices, huddle/small conference rooms, copy/work rooms and break rooms and similar spaces shall be provided with architectural type recessed 2'x2' or 2'x4' luminaires, which have a flat center panel, have an approximate 3500 lumen package, are dimmable to 1%.
5. Common Areas: Corridors, lobbies, and other common spaces shall be illuminated, depending on the function, with combinations of down lights, decorative wall sconces, decorative pendant hung fixtures and recessed flat panel type luminaires.
6. Provide undercabinet type task luminaires under all upper cabinets in all office, break room and work/copy room casework, millwork, etc. Undercabinet luminaires shall be locally separately switched from overhead lighting.
7. Toilet rooms shall be illuminated with wall mounted luminaires located above the urinals and water closets with luminaires located above mirrors/lavatory vanities, as well as down lights spaced 8 feet to 10 feet on center down the center of the room. At a minimum, one (1) fixture located near the door shall be unswitched, and shall be fed by an emergency source in smaller toilet rooms. In larger toilet rooms (over three toilets), there shall be additional downlights fed by an emergency source to illuminate in stalls and pathway to entry/exit.
8. Utility, mechanical, and electrical equipment rooms, and janitor's closets shall be illuminated by 4' strip luminaires with industrial reflectors having 10% minimum up-light and with wire guards.

## **G. Exterior Lighting**

1. All lighting shall be LED with a CRI of 80 and color temperature of 35k.
2. Exterior parking lot, roadway, and pedestrian walkway lighting shall primarily consist of pole mounted LED "Dark Sky" compliant, full cutoff luminaires.
3. Lighting at building entrances shall be provided with exterior decorative wall sconces.
4. Parking lots, roadways, and pedestrian walkways shall be illuminated to a maintained average of 2 foot candles at pavement level, with an average to minimum ratio not exceeding 4:1. Pole mounted luminaires shall be located on traffic islands for protection from damage.
5. In areas where there are no traffic islands or where the islands are too small to provide protection, the poles shall be mounted on 36" high reinforced concrete pole bases. All pole bases are to extend 8'-0" minimum below the finished grade and shall be reviewed for proper design and reinforcement by a licensed practicing professional structural engineer.
6. Luminaires outdoors shall be shielded appropriately to ensure that light from the luminaires does not trespass onto other properties or cause a problem or hazard condition to drivers elsewhere in the area including public access ways.
7. Provide exterior lighting adequate for inspection and repair around utility transformers and generators and provide with battery or inverter back-up and provide these luminaires on separate switches from any other lighting on the circuit.

8. Provisions for site cameras and site wi-fi systems shall be integrated in to site poles as required.

#### **H. Lighting Control**

1. Lighting controls will meet the latest version of the International Energy Conservation Code.
2. Offices will have automatic controls to turn lights off with manual on (vacancy sensor). Storage, restrooms, and other similar areas will have automatic on and off (occupancy sensor). Sensors will be dual technology and will be wall or ceiling mounted to optimize performance
3. Areas with skylights or windows will have dimmable daylighting controls for 15 feet within the daylight area
4. Building entrances will have security dusk to dawn lighting controlled by a photocell and motion sensor. Remaining exterior lighting will be capable of being reduced by at least 30%.
5. An automated lighting control system will be provided for the facility exterior lighting. The interior lighting will be controlled locally. All controls will meet the current requirements of the IECC, and the local jurisdictional.

#### **I. Fire Alarm**

1. Provide an Analog Addressable Fire Alarm System that shall meet the requirements of the codes and NFPA and is suitable for the type and occupancy as defined by the building codes.
2. Fire alarm conductors shall be run in conduit and boxes shall have red covers.
3. Minimum smoke detection will be the basis of design. The system shall utilize photo-electric smoke detection including duct detection, rate-of-rise/fixed temperature heat detection, single-action manual pull-stations, horns, strobes, control modules, monitor modules and relays as necessary to form a complete detection and notification system for the new building.
4. The new work shall be integrated and compatible with the existing campus system. New Fire Alarm Control Panels shall be located at the building served. In addition to panel locations coordinated with Glenwood Springs Fire Department, provide Master Control at OP121 Dispatch, networked to monitor all new work.
5. Provide Brothers or Kroy labelling of all fire alarm devices such that they are visible and readable from the normal viewing positions. The labels shall indicate the network the devices are located on and the associated address of that device.
6. Duct detectors which are inaccessible from the floor shall have a remote indicator light and keyed test switch labeled to match duct detector.
7. The new work shall be integrated and compatible with the existing campus system. New Fire Alarm Control Panels shall be located at the building served. In addition to panel locations coordinated with Glenwood Springs Fire Department, provide Master Control at OP121 Dispatch, networked to monitor all new work.

### **Phase 6B - Administration Building**

#### **A. Normal Power**

1. The size of the service based on the building size of 31,066 square feet will be 600 amps at 480/277 volts.
  - i) Rough-in for four passenger vehicles will be provided.

#### **B. Emergency Power**

1. An emergency generator to accommodate the load of the electrical service in its entirety with an additional 20% spare capacity, including any derating of capacity associated with the elevation of the site. The generator shall be provided in an enclosure exterior to the building. The generator shall provide 277/480V, 3-phase, 4-wire output power to the building distribution system via automatic transfer switches.
2. The generator shall utilize an integral radiator unit. Provide engine start batteries and chargers. Provide oil jacket heaters and battery warmers as necessary for cold starting.
3. Provide system condition and alarm reporting for each generator at a remote status and alarm panel located at OP121 Dispatch, Bus Storage and Operations Building. Provide a remote paging feature to the Owner's maintenance and/or other responding personnel. Provide alarm of "low fuel" at eight (8) hours full load run time remaining.
4. Provide a sub-base mounted fuel tank for thirty-six (36) hours of full load operation and provisions for emergency fuel delivery. Emergency fuel delivery shall be made available and provided to ensure the tank may be completely replenished before the tank fuel is run dry. The engine shall operate on no. 1 or no. 2 diesel.
5. Provide a generator tap box, and a resistive load bank rated at a minimum of 40% of the generator full load kW rating with the ability to step the load onto the system while running to maintain efficient generator loading.
6. Provide two transfer switches, one each for emergency and life safety power. The transfer switches and emergency distribution and branch panel boards shall all be required to be located within electrical room.

#### **C. Uninterruptable Power Supply**

1. Uninterruptible Power Supply (UPS) system(s) shall be provided for equipment located in the MDF and IDF rooms. UPS shall be rack mountable in a standard 19" 4-post server rack.
2. Where the number of equipment loads being served are under 5 items, the items shall be served by local UPS units. Where the number of loads exceed 5, the UPS shall be a centralized unit with a distribution panel board on the output to serve the loads from a common location. Refer to the panel board requirements<sup>14</sup> above for additional information.
3. Battery system shall be sized for a minimum of fifteen minutes of backup supply.

#### **D. Power Distribution**

1. Separate panelboards for lighting, HVAC, and receptacle power will be required.
  - i) All panelboards/switchboards will be located in the electrical room.
  - ii) Panelboards shall have minimum 30% spare capacity and will have copper bussing.
  - iii) TVSS will be provided for all main panels and switchboards.
  - iv) Surge protection shall be provided on main panelboards.
  - v) Arc flash labeling for distribution equipment shall be provided.
  - vi) Lamecoid labeling will be required for panels and equipment with labeling information per NEC.
  - vii) Arc Flash analysis shall be provided by the contractor.
  - viii) Provide Owner submetering as required by code. The meters shall be digital and capable of monitoring 3-phases independently and overall, for maximum, peak, average, and RMS of the following: amperes, voltages, power factor, volt-amps, wattage and kVar. The system shall be capable of recording these values for a period of not less than 30 days continuously and shall also generate a legible report. The metering system shall be networked together with a Main PC and shall be

- located in the Owners designated area. Energy usage shall be reported on a graphical interface as required by code.
2. Commissioning for generator, transfer switches, switchboards, grounding systems, connections, and lighting controls shall be provided.
  3. Provide local disconnect switches for mechanical equipment. Mechanical equipment shall be coordinated to meet the available fault current.
  4. All interior building conductors shall be installed in conduit and shall be of the following types: electrical metallic tubing (EMT), intermediate metal conduit (IMC), or galvanized rigid conduit (GRC), unless otherwise noted.
  5. Provide compression fittings on EMT conduits. Flexible steel conduit shall be utilized for equipment connections in dry areas and liquid-tight conduit shall be utilized in areas subject to moisture unless otherwise noted.
  6. Exterior conduit installed underground shall be schedule 40 PVC with PVC Coated GRC elbows.
  7. Armored (AC) and Metal Clad (MC), cable shall be acceptable for use in this facility where concealed within wall and ceiling cavities. All homerun circuitry to panelboards shall be installed in conduit.

#### **E. Devices and Outlets**

1. Building standard general-purpose receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R.
2. Floor outlets are required in conference rooms and open space areas. Floor outlet shall be fire rated poke thru's above grade and weatherproof boxes at grade.
3. Ground Fault Circuit Interrupter (GFCI) receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R, and isolated ground, computer grade receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R.
4. Provide compression-type two-hole connections on all panel board, transformer, ground bus, switchboard, and switchgear conductor connections. Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the conductor.
5. Private offices shall be provided with two (2) wall mounted fourplex receptacles or four (4) duplex outlets as a minimum. Where printers may be identified to be installed in offices, provide a dedicated duplex at the printer location and branch circuiting shall accommodate two (2) printers per 20A branch circuit.
6. Furniture System Workstations: Branch circuit density as a minimum shall accommodate one (1) 20A circuit per two workstations and shall match the configuration of the systems furniture wiring harness and meet the requirements of the NEC for powered furniture systems.
7. Open office areas shall be provided with a minimum of four (4) duplexes (20A branch circuit). This power is to be placed on the walls of these areas and is in addition to the power requirements for the systems furniture in these areas.
8. The IDF Room requires dedicated 20A branch circuits for the telephone, data, and security systems. Provide four (4) fourplexes, mounted on unistrut above equipment racks, one (1) above each equipment rack and each connected to a dedicated 20A branch circuit.

9. One (1) fourplex receptacle supplied from a dedicated circuit mounted at 7'-0" above finished floor and one (1) standard duplex receptacle shall be provided on each wall of IDF Rooms. One of the dedicated fourplex receptacles shall be mounted on the plywood backboard at 7'-0" above finished floor. The standard duplex receptacles shall be mounted at 18" above finished floor.
10. MDF Room shall have one standard duplex receptacle on each of the "short" walls and two standard duplex receptacles on each of the "long" walls. In addition, provide dedicated 20A branch circuits wherever necessary for the special telecom equipment in this room.
11. Provide a 4" x 1/4" x 12" (minimum length) grounding bar in the MDF room and in all IDF telecom closets. These ground plates shall be interconnected by a #2 AWG copper conductor and shall connect to the main service grounding electrode system.

#### **F. Interior Lighting**

1. All lighting shall be LED with a minimum CRI of 80 and a color temperature of 35k.
2. IDF Rooms and MDF Room shall be provided with strip type luminaires with reflectors having 10% up-light and arranged perpendicular to the Telecom equipment to equally illuminate front and back of equipment racks.
3. Public spaces and lobby areas shall have decorative lighting with downlights and accent lighting.
4. Enclosed offices, huddle/small conference rooms, copy/work rooms and break rooms and similar spaces shall be provided with architectural type recessed 2'x2' or 2'x4' luminaires, which have a flat center panel, have an approximate 3500 lumen package, are dimmable to 1%.
5. Open office space lighting shall be provided by cable or pendant suspended luminaires, which produce 90% indirect and 10% direct light.
6. Common Areas: Corridors, lobbies, and other common spaces shall be illuminated, depending on the function, with combinations of down lights, decorative wall sconces, decorative pendant hung fixtures and recessed flat panel type luminaires.
7. Provide undercabinet type task luminaires under all upper cabinets in all office, break room and work/copy room casework, millwork, etc. Undercabinet luminaires shall be locally separately switched from overhead lighting.
8. Toilet rooms shall be illuminated with wall mounted luminaires located above the urinals and water closets with luminaires located above mirrors/lavatory vanities, as well as down lights spaced 8 feet to 10 feet on center down the center of the room. At a minimum, one (1) fixture located near the door shall be unswitched, and shall be fed by an emergency source in smaller toilet rooms. In larger toilet rooms (over three toilets), there shall be additional downlights fed by an emergency source to illuminate in stalls and pathway to entry/exit.
9. Utility, mechanical, and electrical equipment rooms, and janitor's closets shall be illuminated by 4' strip luminaires with industrial reflectors having 10% minimum up-light and with wire guards.

#### **G. Exterior Lighting**

1. All lighting shall be LED.
2. Exterior parking lot, roadway, and pedestrian walkway lighting shall primarily consist of pole mounted LED "Dark Sky" compliant, full cutoff luminaires.
3. Lighting at building entrances shall be provided with exterior decorative wall sconces.



4. Parking lots, roadways, and pedestrian walkways shall be illuminated to a maintained average of 2 foot candles at pavement level, with an average to minimum ratio not exceeding 4:1. Pole mounted luminaires shall be located on traffic islands for protection from damage.
5. In areas where there are no traffic islands or where the islands are too small to provide protection, the poles shall be mounted on 36" high reinforced concrete pole bases. All pole bases are to extend 8'-0" minimum below the finished grade and shall be reviewed for proper design and reinforcement by a licensed practicing professional structural engineer.
6. Luminaires outdoors shall be shielded appropriately to ensure that light from the luminaires does not trespass onto other properties or cause a problem or hazard condition to drivers elsewhere in the area including public access ways.
7. Provide exterior lighting adequate for inspection and repair around utility transformers and generators and provide with battery or inverter back-up and provide these luminaires on separate switches from any other lighting on the circuit.
8. Provisions for site cameras and site wi-fi systems shall be integrated in to site poles as required.

#### **H. Lighting Control**

1. Lighting controls will meet the latest version of the International Energy Conservation Code.
2. Offices will have automatic controls to turn lights off with manual on (vacancy sensor). Storage, restrooms, and other similar areas will have automatic on and off (occupancy sensor). Sensors will be dual technology and will be wall or ceiling mounted to optimize performance
3. Areas with skylights or windows will have dimmable daylighting controls for 15 feet within the daylight area
4. Building entrances will have security dusk to dawn lighting controlled by a photocell and motion sensor. Remaining exterior lighting will be capable of being reduced by at least 30%.
5. An automated lighting control system will be provided for the facility exterior lighting. The interior lighting will be controlled locally. All controls will meet the current requirements of the IECC, and the local jurisdictional.

#### **I. Fire Alarm**

1. Provide an Analog Addressable Fire Alarm System that shall meet the requirements of the codes and NFPA and is suitable for the type and occupancy as defined by the building codes.
2. Fire alarm conductors shall be run in conduit and boxes shall have red covers.
3. Minimum smoke detection will be the basis of design. The system shall utilize photo-electric smoke detection including duct detection, rate-of-rise/fixed temperature heat detection, single-action manual pull-stations, horns, strobes, control modules, monitor modules and relays as necessary to form a complete detection and notification system for the new building.
4. The new work shall be integrated and compatible with the existing campus system. New Fire Alarm Control Panels shall be located at the building served. In addition to panel locations coordinated with Glenwood Springs Fire Department, provide Master Control at OP121 Dispatch, networked to monitor all new work.

5. Provide Brothers or Kroy labelling of all fire alarm devices such that they are visible and readable from the normal viewing positions. The labels shall indicate the network the devices are located on and the associated address of that device.
6. Duct detectors which are inaccessible from the floor shall have a remote indicator light and keyed test switch labeled to match duct detector.
7. The new work shall be integrated and compatible with the existing campus system. New Fire Alarm Control Panels shall be located at the building served. In addition to panel locations coordinated with Glenwood Springs Fire Department, provide Master Control at OP121 Dispatch, networked to monitor all new work.

## **Phase 8 - Storage Building**

### **A. Normal Power**

1. The size of the service, shall be 100 amps at 120/208 volts. The building shall be fed from the existing GMF building.

### **B. Power Distribution**

1. All panelboards/switchboards will be located in the electrical room.
2. Panelboards shall have minimum 30% spare capacity and will have copper bussing.
3. TVSS will be provided for all main panels and switchboards.
4. Surge protection shall be provided on main panelboards.
5. Arc flash labeling for distribution equipment shall be provided.
6. Lamecoid labeling will be required for panels and equipment with labeling information per NEC.
7. Arc Flash analysis shall be provided by the contractor.
8. Provide Owner submetering as required by code. The meters shall be digital and capable of monitoring 3-phases independently and overall, for maximum, peak, average, and RMS of the following: amperes, voltages, power factor, volt-amps, wattage and kVar. The system shall be capable of recording these values for a period of not less than 30 days continuously and shall also generate a legible report. The metering system shall be networked together with a Main PC and shall be located in the Owners designated area. Energy usage shall be reported on a graphical interface as required by code.
9. Provide local disconnect switches for mechanical equipment. Mechanical equipment shall be coordinated to meet the available fault current.
10. All interior building conductors shall be installed in conduit and shall be of the following types: electrical metallic tubing (EMT), intermediate metal conduit (IMC), or galvanized rigid conduit (GRC), unless otherwise noted.
11. Provide compression fittings on EMT conduits. Flexible steel conduit shall be utilized for equipment connections in dry areas and liquid-tight conduit shall be utilized in areas subject to moisture unless otherwise noted.
12. Exterior conduit installed underground shall be schedule 40 PVC with PVC Coated GRC elbows.
13. Armored (AC) and Metal Clad (MC), cable shall be acceptable for use in this facility where concealed within wall and ceiling cavities. All homerun circuitry to panelboards shall be installed in conduit.
14. Devices and Outlets
15. Building standard general-purpose receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R.
16. Floor outlets are required in conference rooms and open space areas.

17. Ground Fault Circuit Interrupter (GFCI) receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R, and isolated ground, computer grade receptacles shall be 20 Amp, 120 VAC duplex, specification grade NEMA 5-20R.
18. Provide compression-type two-hole connections on all panel board, transformer, ground bus, switchboard, and switchgear conductor connections. Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the conductor.

#### **C. Interior Lighting**

1. All lighting shall be LED with a minimum CRI of 80 and a color temperature of 35k.
2. Common Areas: Corridors, lobbies, and other common spaces shall be illuminated, depending on the function, with combinations of down lights, decorative wall sconces, decorative pendant hung fixtures and recessed flat panel type luminaires.
3. Toilet rooms shall be illuminated with wall mounted luminaires located above the urinals and water closets with luminaires located above mirrors/lavatory vanities, as well as down lights spaced 8 feet to 10 feet on center down the center of the room. At a minimum, one (1) fixture located near the door shall be unswitched, and shall be fed by an emergency source in smaller toilet rooms. In larger toilet rooms (over three toilets), there shall be additional downlights fed by an emergency source to illuminate in stalls and pathway to entry/exit.
4. Utility, mechanical, and electrical equipment rooms, and janitor's closets shall be illuminated by 4' strip luminaires with industrial reflectors having 10% minimum up-light and with wire guards.

#### **D. Exterior Lighting**

1. All lighting shall be LED with a CRI of 80 and color temperature of 35k.
2. Exterior parking lot, roadway, and pedestrian walkway lighting shall primarily consist of pole mounted LED "Dark Sky" compliant, full cutoff luminaires.
3. Lighting at building entrances shall be provided with exterior decorative wall sconces.
4. Parking lots, roadways, and pedestrian walkways shall be illuminated to a maintained average of 2 foot candles at pavement level, with an average to minimum ratio not exceeding 4:1. Pole mounted luminaires shall be located on traffic islands for protection from damage.
5. Luminaires outdoors shall be shielded appropriately to ensure that light from the luminaires does not trespass onto other properties or cause a problem or hazard condition to drivers elsewhere in the area including public access ways.
6. Provisions for site cameras and site wi-fi systems shall be integrated in to site poles as required.

#### **E. Lighting Control**

1. Lighting controls will meet the latest version of the International Energy Conservation Code.
2. Building entrances will have security dusk to dawn lighting controlled by a photocell and motion sensor. Remaining exterior lighting will be capable of being reduced by at least 30%.
3. An automated lighting control system will be provided for the facility exterior lighting. The interior lighting will be controlled locally. All controls will meet the current requirements of the IECC, and the local jurisdictional.

# **Telecommunications Design**

## **Phase 6A - Transit Station**

### **A. Project Description**

1. The telecommunications system at the RFTA Phase 6B Administrative Building aims to provide reliable, efficient, and secure infrastructure. Services and systems supported by the communications network include voice, data, CATV, fire alarm, electronic security, building automation, and Owner systems.
2. Telecommunications systems shall comply the RFTA Phase 6 Program of Requirements (POR) dated January 16, 2023, as well as the National Electrical Code (NEC), EIA/TIA standards, and BICSI.

### **B. Telecommunications**

1. Outside Plant:
  - i) The new Transit Station will be served from existing RFTA Glenwood campus main point-of-presence and MDF, Data Equipment Room FM531.
  - ii) At a minimum, a concrete-encased ductbank with four (4) 4" conduits shall be provided between the nearest serving communications vault and the communications entrance facility inside the Transit Station.
  - iii) New vaults shall be provided as required.
  - iv) The incoming cabling shall consist of one (1) 12-strand and one (1) 6-strand OS2 singlemode armored optical fiber for communications and fire alarm, respectively.
  - v) The fiber optic cabling shall be terminated to a rack-mount fiber optic enclosure.
2. Equipment Facilities:
  - i) The Transit Station shall have a single Telecom Room (TR) serving as the primary telecom room and communications entrance facility (EF).
  - ii) This TR shall house telecommunications distributions equipment supporting data, voice, wireless access, and structured cabling distribution for horizontal cabling.
3. Distribution Frames:
  - i) The TR shall house an Intermediate Distribution Frame (IDF).
  - ii) Distribution frames consist of:
    - (1) Free-standing floor-mounted 4-post racks,
    - (2) Rack-mounted RJ45 patch panels (Category 6A minimum compliance).
    - (3) Rack-mounted fiber optic patch panels.
    - (4) Wall mount copper backbone termination panels.
    - (5) Cross-connect cabling and patch cables.
    - (6) Cable management.
    - (7) Cable runway.
4. Telecommunications Spaces:
  - i) All new Telecommunications Spaces shall be built out in adherence to current BICSI best practices with the following considerations:
    - (1) Architectural
      - (a) Minimum interior dimensions: TR/IDF: 10'-0" x 10'-0"
      - (b) Floors shall be sealed concrete.
      - (c) Open to structure with no dropped ceiling.
      - (d) Finished walls along all four sides that extend to building structure.
      - (e) Walls shall be lined with AC-grade void-free ¾" plywood painted on all sides with two (2) coats of fire-retardant white paint.

- (f) Doors to be a minimum of 36" wide x 84" tall and swing out, away from the room, where permitted by code.
- (g) Entrance to the room shall not be through an electrical room, mechanical room, or a non-circulation space (i.e., storage or restroom).
- (2) Electrical/Lighting:
  - (a) Per Rack: One (1) dedicated, non-switched 30A 120V circuit on a twist lock receptacle (L6-30R) and one (1) dedicated, non-switched 20A 120V circuit on a quad receptacle (5-20R) mounted to the cable runway to the rear of the rack.
  - (b) 20A 120V duplex convenience outlets placed at 6' intervals on perimeter walls at standard outlet height, with at least one (1) per wall.
  - (c) Lighting with a minimum of 50 foot-candles (538 lux measured at 3 feet (1 meter) from the floor in front of a behind the equipment racks. Provide one light fixture with emergency power or battery pack.
  - (d) An electrical panel shall be provided inside each room and shall be dedicated to serving only the equipment in the telecom room.
- (3) Mechanical/Plumbing:
  - (a) A dedicated fan coil unit (FCU) that maintains the temperature between 64° and 75° and humidity between 30% and 50%. FCU shall be located outside the telecom room such that only serving supply/return ductwork is in the space.
  - (b) VAV's may be used in TR/IDFs as heat loads dictate and may be located in the telecommunications space.
  - (c) Ductwork or piping (e.g., water, waste, steam) shall not be routed through, above, or in the walls enclosing the telecommunications space.
- 5. Grounding and Bonding:
  - i) All telecommunications equipment will be bonded to the electrical system ground per TIA-607-D standard.
  - ii) The primary bonding busbar (PBB) shall be located in the telecom room.
    - (1) The PBB shall be connected to the main grounding electrode in the main electrical panel and to the cable runway, equipment rack bonding busbar (RBB), and building steel within the telecom room.
- 6. Horizontal Infrastructure and Cabling:
  - i) Horizontal cabling shall be installed in cable tray or J-hooks above accessible ceilings to the conduit termination at the outlet.
  - ii) Cabling shall be installed in conduit through inaccessible locations, such as gypsum board ceilings and walls.
  - iii) 4" conduit sleeves shall be provided from the TR to above accessible ceilings to allow cabling installation.
  - iv) Re-enterable fire-rated cable pathways shall be provided at fire-rated partitions.
  - v) Two (2) 2" conduits, each with a weatherhead, shall be provided as a pathway from the IDF to the roof for radio antennae or satellite connectivity.
  - vi) Telecom outlets shall consist of a 4-11/16" x 4-11/16" x 2-1/8" metal outlet box with a 1-gang mud-ring cover plate.
  - vii) 1" EMT shall be routed from each outlet to the nearest accessible ceiling space.
  - viii) Faceplates shall be thermoplastic with label windows at the top and bottom with four (4) ports to accept keystone-style jacks.

- ix) Wall phones shall have a 1-port stainless steel wall plate with mounting studs.
- x) All horizontal cabling shall be four-pair Category 6A UTP, plenum rated.
- xi) Connectors shall be IDC-type Category 6A rated RJ45/8P8C, non-keyed. All terminations shall be T568B.

(1) Basis of Design:

- (a) Belden
- (b) Commscope
- (c) Leviton
- (d) Superior Essex

xii) Typical outlet configurations:

- (1) Workstation: two (2) Category 6A cables
- (2) Wireless access points: two (2) Category 6A cables
- (3) CCTV cameras: one (1) Category 6A cable

- 7. Wireless access points shall be located to provide Wi-Fi coverage throughout the building and immediate building exterior (building-mounted) to achieve 99% coverage.

### **C. Audio Visual and Controls Systems**

#### **1. PA System**

- i) The PA system will provide audible notification of announcements and recorded content.
- ii) The PA system will integrate with a visual display system that presents departures, arrivals, and bus boarding location.
- iii) The public address system will consist of:
  - (1) In-ceiling or surface mounted loudspeakers
  - (2) Power amplifier and digital signal processor
  - (3) Push-to-talk paging microphone
  - (4) Audio source intake from automated scheduling system, weather alert system, and other operational system equipment.

#### **2. Digital Signage**

- i) Digital signage displays communicate information by playing content from a digital signage player.
- ii) Digital signage will be sized based on AVIXA DISCAS Basic Decision Making viewing with a minimum element height of 4%. (ANSI/INFOCOMM V202.01:2016)
- iii) The standard player solution uses:
  - (1) LED/LCD displays mounted on tilt wall mount, Panasonic or equal.
  - (2) Digital signage players with 64GB micro SD card, BrightSign or equal.
  - (3) Data outlet and duplex power receptacle at display height.
  - (4) Content shall be dynamically pulled content from the cloud.

#### **3. Audiovisual Systems by Space**

- i) Terminal Exterior
  - (1) Passenger loading/unloading zones.
  - (2) PA System
- ii) Lobby / Waiting
  - (1) This entrance space will be utilized by customers for waiting, checking schedules, purchasing tickets, and for accessing the restrooms.
  - (2) This system will include:
    - (a) PA System
    - (b) Digital Signage



- iii) Driver Lounge
  - (1) The driver's breakroom shall have a single display for use by the terminal drivers.
  - (2) This display is intended to display on going weather and have the audio portion of the broadcast broadcasted through PA speakers mounted in the ceiling.

#### **D. Electronic Safety and Security**

1. Electronic Security Overview: the electronic security system at Administration Building shall enhance safety and security within the facilities, ensuring a secure environment for staff and visitors. This section contains proposed access control and video surveillance systems.
2. Access Control:
  - i) Access Control equipment (system controllers, credential readers, alarm switches, field control modules, electronic door hardware, network equipment and power supplies) will be deployed and complement the Roaring Fork Transit Authority operation security plan, policies, and procedures.
    - (1) Basis of Design: Nice/Linear eMerge 5000.
  - ii) All cable and wires will meet or exceed the individual device manufacturers' recommendation.
  - iii) Head end equipment, network equipment, associated control modules and required supporting devices are to be located within a secure Telecom Room.
  - iv) Credential reader technology will be determined following the selection of a credential type.
    - (1) Basis of Design: HID
  - v) The building exterior will be monitored through credential doors, and door contacts.
  - vi) Interior locations will be discussed with the owner. It is expected at this time that the following rooms will require access control:
    - (1) Station Clerk/Ticketing OP155
    - (2) Road Supervisor OP151
    - (3) IDF FM544
3. Surveillance Systems:
  - i) Surveillance system equipment (servers, cameras, control modules, mounts, power supplies and network switches) will be deployed and complement the Roaring Fork Transit Authority Operation Security plan, policies, and procedures.
    - (1) Basis of Design: Mobotix.
  - ii) The surveillance system equipment shall be fully compatible and integrated with the access control system and all intrusion detection equipment.
  - iii) All headend and or network equipment will be installed within a secured telecom or security room.
  - iv) All cable and wires will meet or exceed the individual device manufacturers' recommendations. Cable runs will not exceed device manufacturers recommendations and will terminate in the secured telecom room.
  - v) Surveillance system equipment shall monitor and store a minimum of 60-days of video at 30 fps frame rate.
  - vi) Camera locations and specific views will be determined by the technology design team or specified by Owners.
  - vii) The following recommended camera installation locations will be coordinated with the project team.
    - (1) Access-controlled doors.

- (2) Elevator Cab
- (3) Hallways

### **Phase 6B - Administration Building**

#### **A. Telecommunications**

1. The telecommunications system at the RFTA Phase 6B Administrative Building aims to provide reliable, efficient, and secure infrastructure. Services and systems supported by the communications network include voice, data, CATV, fire alarm, electronic security, building automation, and Owner systems.
2. Telecommunications systems shall comply the RFTA Phase 6 Program of Requirements (POR) dated January 16, 2023, as well as the National Electrical Code (NEC), EIA/TIA standards, and BICSI.
3. Outside Plant:
  - i) Same as Building 6A
4. Equipment Facilities:
  - i) The Administration Building shall have a Main Equipment Room (ER) serving as the primary telecom room and communications entrance facility.
  - ii) Additional telecom rooms (TR's) shall be centrally located on each floor and should be vertically stacked, floor-to-floor to best facilitate cable routing between levels.
  - iii) The ER and TRs shall house telecommunications distribution equipment supporting data, voice, wireless access, and structured cabling distribution for both horizontal and backbone cabling.
5. Distribution Frames:
  - i) The ER and each TR will house an intermediate Distribution Frame (IDF).
  - ii) Distribution frames consist of:
    - (1) Free-standing floor-mounted 4-post racks,
    - (2) Rack-mounted RJ45 patch panels (Category 6A minimum compliance).
    - (3) Rack-mounted fiber optic patch panels.
    - (4) Wall mount copper backbone termination panels.
    - (5) Cross-connect cabling and patch cables.
    - (6) Cable management.
    - (7) Cable runway.
6. Telecommunications Spaces:
  - i) Same as Building 6A.
7. Grounding and Bonding:
  - i) All telecommunications equipment will be bonded to the electrical system ground per TIA-607-D standard.
  - ii) The primary bonding busbar (PBB) shall be located in the ER and be connected to the grounding electrode in the main electrical panel.
  - iii) Secondary bonding busbars (SBB) shall be provided in each TR and shall be connected to the electrical panelboard, cable runway, equipment rack bonding busbar (RBB), and building steel within the telecom room.
  - iv) The Telecommunications Bonding Backbone (TBB) shall extend from the PBB to the SBB on the top floor, with each intermediate SBB tapping off the TBB.
  - v) Bonding provisions shall be provided for cable tray and conduit to connect to the telecommunications bonding system.
8. Horizontal Infrastructure and Cabling:

- i) Same as Building 6A.
  - ii) Backbone Infrastructure and Cabling:
  - iii) Backbone infrastructure and cabling shall maintain a hierarchical star topology.
  - iv) Backbone cabling shall be routed in basket-style cable tray above accessible ceilings.
  - v) EMT conduit shall be used where cabling is routed through inaccessible partitions; pull-boxes shall be provided, as required.
  - vi) The following backbone cables will be homerun from the ER to each TR:
    - (1) One (1) 12-strand Singlemode OS2 optical fiber, plenum-rated (OFNP)
    - (2) One (1) 25-pair Category 5e UTP, plenum-rated – for analog phone lines required to support the life safety systems and elevators.
  - vii) All fiber strands shall be terminated and housed in a fiber optic patch panel.
  - viii) Fiber connectors shall be UPC, ceramic, epoxy polish, and LC type. Fiber connectors shall be pre-connectorized pigtail assemblies and fusion spliced to the backbone.
  - ix) Each pair of the Cat5e UTP cabling shall be terminated to pre-loaded rack mount backbone patch panel in the ER and in each TR.
9. Distributed Antenna Systems (DAS)
- i) Life safety DAS (ERRCS) and cellular DAS systems are not included in the current design scope.
  - ii) An ERRCS will be required and should be coordinated with the AHJ. A
  - iii) Cellular DAS should be considered to augment cellular connectivity inside the facility.

## **B. Audio Visual and Control Systems**

- 1. Digital Signage
  - i) Same as Building 6A.
- 2. Room Scheduling
  - i) Room scheduling displays are intended to communicate room booking information by pulling schedule data from a central database or calendar.
  - ii) At this time, all conference rooms are intended to have a room scheduling panel. However, the project may target savings in these systems by downsizing the touch panel to a 5" or 7" model or forego the touch panel entirely and only installing rough-in.
  - iii) Room scheduling panels are anticipated at the following spaces:
    - (1) Multipurpose
    - (2) Small Meetings
    - (3) Standard Conference (Qty 2)
    - (4) Large Conference
- 3. Audiovisual Systems by Space
  - i) Pre-function
    - (1) This entrance space will be utilized for multiple functions, including as a pre-function area for the adjacent multipurpose space or overflow for the multipurpose space.
    - (2) This system will include:
      - (a) Displays, wall-mounted above counter height
      - (b) A digital signage player
      - (c) A wired HDMI video input on the wall
      - (d) A wireless content sharing device

- (e) In-ceiling loudspeakers
  - (f) A wall-mounted button panel to control the system (display on/off, audio volume, video source selection).
- ii) Multipurpose
  - (1) To keep this space functional for multiple uses and configurations, the AV systems included will be relatively minimal.
  - (2) This system will include:
    - (a) Displays, wall-mounted above counter height
  - (3) A wired HDMI video input available on the wall
    - (a) A wireless content sharing device
    - (b) In-ceiling loudspeakers
    - (c) Wireless microphones (qty 2)
    - (d) A wall-mounted button panel to control the system (display on/off, audio volume, video source selection).
- iii) Small Meeting
  - (1) The small meeting room is intended to be collaborative break-out spaces used by small groups.
  - (2) These systems will include:
    - (a) Displays, wall-mounted above table height.
    - (b) A wired HDMI video input, available on the wall.
    - (c) A wireless content sharing device.
    - (d) A wall-mounted button panel to control the system (display on/off, audio volume, video source selection).
    - (e) BYO video conferencing system using Vaddio HuddleSHOT or equal, which provides a camera, microphone, and speaker in a wall-mounted sound bar form factor.
- iv) Standard Conference (Qty: 2)
  - (1) The standard conference rooms are intended to be collaborative meeting spaces used by small-to-medium sized groups.
  - (2) These spaces have walls composed entirely of glazing which limits the ability to mount AV equipment to the walls. This necessitates the use of systems mounted to mobile furniture or ceiling-mounted equipment.
  - (3) These systems will include:
    - (a) Displays, mounted to a portable cart OR ceiling mount projector and motorized screen.
    - (b) A wired HDMI video input, available at the portable cart OR via poke-thru at the floor and extended to the tabletop.
    - (c) A wireless content sharing device.
    - (d) A surface-mounted touch screen or button panel to control the system (display on/off, audio volume, video source selection) located at the conference room table.
    - (e) BYO video conferencing system: for a portable cart, a Vaddio HuddleSHOT or equal, which provides a camera, microphone, and speaker in a sound bar form factor OR an installed solution that would leverage ceiling-mounted microphones and loudspeakers, and a camera integrated into the projection screen.
- v) Large Conference (Qty: 1)

- (1) The Large Conference room is intended to be an executive board room and meeting space for larger groups.
- (2) This space has walls composed entirely of glazing which limits the ability to mount AV equipment to the walls. This necessitates the use of ceiling-mounted AV equipment and connectivity at the table via poke-thru' s at the floor.
- (3) These systems will include:
  - (a) A ceiling mount projector and motorized screen.
  - (b) Several wired HDMI video inputs, via poke-thru at the floor and extended to the tabletop.
  - (c) A wireless content sharing device.
  - (d) A tabletop touch screen to control the system (display on/off, audio volume, video source selection) located at the conference room table.
  - (e) BYO video conferencing support that allows users with a laptop running Teams or Zoom to leverage the installed AV components (microphones, loudspeakers, camera) to conduct meetings.
  - (f) An integrated video conferencing system using an in-room PC that allows the system to run natively without the need for an external laptop. This system includes ceiling-mounted microphones and loudspeakers, and two (2) PTZ cameras – one integrated into the projection screen and the other mounted to the ceiling at the opposite end of the room.

### **C. Electronic Safety and Security**

1. Electronic Security Overview: the electronic security system at Administration Building shall enhance safety and security within the facilities, ensuring a secure environment for staff and visitors. This section contains proposed access control and video surveillance systems.
2. Access Control:
  - i) Access Control equipment (system controllers, credential readers, alarm switches, field control modules, electronic door hardware, network equipment and power supplies) will be deployed and complement the Roaring Fork Transit Authority operation security plan, policies, and procedures.
    - (1) Basis of Design: Nice/Linear eMerge 5000.
  - ii) All cable and wires will meet or exceed the individual device manufacturers' recommendation.
  - iii) Head end equipment, network equipment, associated control modules and required supporting devices are to be located within a secure Telecom Room.
  - iv) Credential reader technology will be determined following the selection of a credential type.
    - (1) Basis of Design: HID
  - v) The building exterior will be monitored through credential doors, and door contacts.
  - vi) Interior locations will be discussed with the owner. It is expected at this time that the following rooms will require access control:
    - (1) Secure Storage/Safe AD144,
    - (2) Mech FM544,
    - (3) Storeroom/Media AD223,
    - (4) MDF FM541,
    - (5) Level 1 Electrical Room,
    - (6) Secure File Storage AD206,

- (7) IDF FM542,
  - (8) Level 2 Electrical Room,
  - (9) IDF FM543,
  - (10) Level 3 Electrical Room,
  - (11) Special Project Mgr AD112,
  - (12) Executive Officer AD104,
  - (13) Executive Officer AD103,
  - (14) Executive Officer AD102,
  - (15) Executive Officer AD101.
3. Surveillance Systems:
- i) Surveillance system equipment (servers, cameras, control modules, mounts, power supplies and network switches) will be deployed and complement the Roaring Fork Transit Authority Operation Security plan, policies, and procedures.
    - (1) Basis of Design: Mobotix.
  - ii) The surveillance system equipment shall be fully compatible and integrated with the access control system and all intrusion detection equipment.
  - iii) All headend and or network equipment will be installed within a secured telecom or security room.
  - iv) All cable and wires will meet or exceed the individual device manufacturers' recommendations. Cable runs will not exceed device manufacturers recommendations and will terminate in the secured telecom room.
  - v) Surveillance system equipment shall monitor and store a minimum of 60-days of video at 30 fps frame rate.
  - vi) Camera locations and specific views will be determined by the technology design team or specified by Owners.
  - vii) The following recommended camera installation locations will be coordinated with the project team.
    - (1) Access-controlled doors.
    - (2) Elevator Cab
    - (3) Hallways

## **Phase 8 - Storage Building**

### **D. Telecommunications**

- 1. Limited telecommunications scope is expected for the new Storage Building. Backbone cabling will be run from the nearest serving IDF to support communications and security requirements.
- 2. A wall mount telecommunication enclosure will house an IDF for consolidation of backbone cabling, horizontal cabling, and network equipment.
- 3. Communications outlets and wireless access points shall be provided as dictated by program requirements.

### **E. Electronic Safety and Security**

- 1. Electronic security system equipment will be provided at the Storage Building and will be tied back to systems elsewhere on campus for monitoring and control.
- 2. Overhead door contacts and surveillance cameras are expected to be installed at exterior doors to the storage building.
- 3. Surveillance cameras are expected to be installed at interior and exterior locations at the storage building.



## **Acoustical Design**

### **A. General Information**

1. Acoustical design criteria outlined herein are based on the January 16, 2023, RFTA Program of Requirements (POR) for the project. Salas O'Brien is hereby confirming acoustical design criteria identified in the POR, proposing supplementary acoustical design criteria not identified in the POR, and providing recommendations to fulfill these acoustical design goals.

### **Phase 6A – Transit Station**

#### **A. Room Acoustics**

1. Reverberation Time Criteria
2. Reverberation Time (RT) criteria is a single number rating that describes average reverberation in a space (125-4000Hz). Per the POR, spaces should be designed to control RTs to not exceed those listed in the following tables. Room type RT values that are not identified in the POR are indicated with an asterisk (\*).

| <u>Room Type</u> | <u>Maximum RT (seconds)</u> |
|------------------|-----------------------------|
| Office (private) | 0.6                         |
| Ticketing        | 0.8                         |
| Lounge           | 0.8*                        |
| Lobby            | 1.0*                        |

3. Office (private)
  - i) This room should have a mineral fiber type sound-absorbing ACT ceiling (NRC 0.60 minimum, CAC 35 minimum) throughout the entire ceiling area.
4. Ticketing
  - i) This room should have a mineral fiber type sound-absorbing ACT ceiling (NRC 0.85 minimum, CAC 35 minimum) throughout the entire ceiling area. Additionally, the floor should be carpeted.
5. Lounge
  - i) These rooms should have mineral fiber type sound-absorbing ACT ceilings (NRC 0.80 minimum, CAC 35 minimum) throughout the entire ceiling area.
6. Lobby
  - i) This space should have a 1" thick minimum sound-absorptive ceiling finish (NRC 0.80 minimum) concealing most of the roof underside area.

#### **B. SOUND ISOLATION**

1. Sound Isolation Criteria for Interior Walls
  - i) Sound Transmission Class (STC) is a single number rating that describes a partition's sound transmission loss in a controlled lab environment. Sound isolation in the field (ASTC) is typically 3-5 points lower than the partition's STC measured in a lab. Per the POR, interior elements should be designed to perform at STC values equal or greater than those listed in the following tables. Room type STC values not identified in the POR are indicated with an asterisk (\*). It is our understanding that operable partitions will not be used on this project.

| <u>Room Type</u> | <u>Minimum STC</u> |
|------------------|--------------------|
| Office (private) | 45                 |
| Ticketing        | 45                 |
| Toilet (private) | 45*                |

## 2. Interior Wall Types

- i) For STC 45 walls, partition should consist of two layers of 5/8", 2psf minimum gypsum board on one side of a single 3-5/8" steel stud with batt insulation in stud cavities and one layer of 5/8", 2psf gypsum board on the other side of the stud. This wall shall extend and seal to floor/roof deck above.

## 3. Interior Doors

- i) The POR calls for STC 45 rated solid-core wood doors. However, we do not recommend specifying STC rated door/frame/hardware assemblies for this project due to their high costs and low value. STC rated solid-core wood door/frame assemblies come as a kit of many parts, and in our experience, do not typically perform better than properly specified built-up gasketed door/frame/hardware assemblies that are simpler to install. We recommend that interior doors at rooms with STC partitions consist of kerfed steel frame filled with mineral wool, solid-core wood door with 6psf minimum surface weight, 5/8" minimum laminated glass at any vision lite, kerf-mounted silicone bulb type head/jamb seals, fixed neoprene multi-fin door bottom sweep, and metal threshold. If requirement for STC rated door/frame/hardware assemblies is maintained, then we instead recommend STC 45+ rated wood-veneer-faced hollow metal doors that have the door, frame, and hardware factory-assembled.

## 4. Interior Windows

- i) Interior windows in walls with STC 45 requirements should have steel frame filled with mineral wool, dual glazing consisting of 1/4" minimum laminated glass and 3/16" minimum monolithic glass separated by a 2" minimum airspace, and neoprene or silicone gasketing.

## 5. Sealed Joints and Penetrations

- i) All walls and floors at sound isolating assemblies are to have backer rod and acoustical sealant applied on both sides of the wall and floor at perimeter joints and at penetrations due to structural and building service systems.

# C. BUILDING SERVICES NOISE

## 1. Noise Criteria

- i) Noise Criteria (NC) is a single number rating that describes maximum background (ambient) noise levels within interior spaces. Per the POR and 2023 ASHRAE Handbook – HVAC Applications, building services should be designed to produce NC levels not exceeding those listed in the following tables.

| <u>Room Type</u> | <u>Maximum NC</u> |
|------------------|-------------------|
| Office (private) | 35                |
| Ticketing        | 35                |
| Lounge           | 40                |
| Lobby            | 40                |
| Corridor         | 45                |

2. Air Handling Units
  - i) Air handling units should be selected for efficient operation and low noise levels to minimize the extent of noise reduction measures necessary. Rooftop-mounted air handling units should be supported directly on a vibration isolation curb with constrained spring isolators.
3. Heat Pumps
  - i) Heat pumps should be quiet-type with insulated panels and compressor enclosures. Heat pumps should be located away from spaces with criteria of NC-40 or less.
4. VAV Terminal Units
  - i) VAV terminal units should be quiet-type (e.g., Price SDV) to minimize the extent of noise reduction measures necessary.
5. Duct Distribution
  - i) Avoid running ductwork serving spaces with criteria of NC-35 or less directly from an adjacent, noisy space such as a mechanical room or restroom. Main ducts should be run within hallways where possible, with separate branch ducts serving each individual space.
  - ii) Ducts should be designed to have duct air velocities not exceeding the following:

|                                                                      | NC-30                           | NC-35 | NC-40 | NC-45 | NC-50 |
|----------------------------------------------------------------------|---------------------------------|-------|-------|-------|-------|
| Location:                                                            | Maximum duct air velocity (fpm) |       |       |       |       |
| Main supply and return ducts outside of space                        | 1800                            | 2000  | 2200  | 2400  | 2600  |
| Main supply and return ducts within space (including above ceilings) | 1100                            | 1300  | 1500  | 1700  | 1900  |
| Branch supply and return ducts                                       | 800                             | 900   | 1000  | 1100  | 1200  |
| Terminal supply and return ducts < 10 diameters from outlet/inlet    | 500                             | 550   | 600   | 650   | 700   |

- iii) Air balancing dampers should be located at branch takeoffs away from supply outlets and return inlets – a minimum of 5 duct diameters from the nearest terminal device.
- iv) Supply diffusers and return grilles should have NC ratings at least 5 points below the space's NC target.
- v) Return air systems at spaces with gasketed doors should have a lined sheet metal transfer duct in a "U" or "S" profile thru partitions. Minimum length of transfer duct should be 7 duct diameters. Return air grilles within ACT ceilings should have a lined sheet metal elbow boot. Minimum length of boot to be 4 duct diameters.

6. Duct Lining
  - i) Internal duct lining should be used at final branch return ducts and at supply ducts downstream of VAV terminal units serving spaces with criteria of NC-40 or less. Duct lining should be 1" thick minimum, 1.5 pcf density fiberglass core with integral coated facing.
7. Flex Ducts
  - i) Flex ducts with 1" thick acoustical insulation should be provided for all concealed terminal supply and return ducts located less than 10 duct diameters from supply diffusers and return grilles.
8. Duct Sound Attenuators
  - i) For general pricing purposes, anticipate a 7-foot long elbow duct sound attenuator in the main supply and return duct for each AHU, a 7-foot long duct sound attenuator downstream of heat pumps serving spaces that are NC-40 or less, and a 5-foot long duct sound attenuator downstream of VAV terminals serving spaces that are NC-30.
9. Vibration Isolation
  - i) Mechanical and plumbing equipment is to be supported from vibration isolators per the 2023 ASHRAE Handbook – HVAC Applications. Ductwork and piping connections to vibration isolated equipment are to use flexible duct/pipe connectors.
  - ii) All transformers should be supported from elastomer-in-shear mounts. Electrical connections to transformers and vibration isolated mechanical/plumbing equipment should be made with flexible steel conduit installed in a slack "U-shape" in sufficient length to not become taut during normal operation.
10. Transformer Sound Levels
  - i) Transformer sound levels should be at least 3dB less than sound levels indicated in NEMA ST 20.
11. Electrical/Telecommunications Box Penetrations
  - i) For back boxes recessed into sound walls, back-to-back boxes should be staggered a minimum of 16 inches o.c. Back boxes and conduit connections should be covered with sound putty pads (e.g., Kinetics Isobacker).

## **Phase 6B - Administration Building**

### **A. ROOM ACOUSTICS**

#### **1. Reverberation Time Criteria**

| <u>Room Type</u>                         | <u>Maximum RT (seconds)</u> |
|------------------------------------------|-----------------------------|
| Conference                               | 0.6*                        |
| Meeting                                  | 0.6*                        |
| Quiet                                    | 0.6*                        |
| Office (private)                         | 0.6                         |
| Office/Workspace/Copy/Plan (shared/open) | 0.8                         |
| Workroom                                 | 0.8*                        |
| Flexible                                 | 0.8*                        |
| Fitness                                  | 0.8*                        |
| Locker                                   | 0.8*                        |
| Kitchenette                              | 0.8*                        |
| Pre-Function                             | 1.0*                        |
| Lounge/Reception                         | 1.0*                        |

2. Conference, Meeting, Flexible
  - i) These rooms should have mineral fiber type sound-absorbing ACT ceilings (NRC 0.80 minimum, CAC 35 minimum) throughout the entire ceiling area. Two adjacent walls should have 1" sound-absorbing panels (NRC 0.80 minimum) from 3'-0" AFF to door height.
3. Flexible
  - i) This room should have a mineral fiber type sound-absorbing ACT ceiling (NRC 0.80 minimum, CAC 35 minimum) throughout the entire ceiling area. Interior walls should have tackable 1" sound-absorbing panels (NRC 0.80 minimum) from 3'-0" AFF to door height.
4. Quiet, Office (private), Fitness, Locker, Kitchenette
  - i) These rooms should have mineral fiber type sound-absorbing ACT ceilings (NRC 0.60 minimum, CAC 35 minimum) throughout the entire ceiling area.
5. Office/Workspace/Copy/Plan/Workroom (shared/open)
  - i) These rooms should have mineral fiber type sound-absorbing ACT ceilings (NRC 0.85 minimum, CAC 35 minimum) throughout the entire ceiling area. Additionally, the floor should be carpeted.
6. Pre-Function, Lounge/Reception
  - i) These rooms should have mineral fiber type sound-absorbing ACT ceilings (NRC 0.80 minimum, CAC 35 minimum) throughout the entire ceiling area.

## B. SOUND ISOLATION

### 1. Sound Isolation Criteria for Interior Walls and Floors

| Room Type                                                                     | Minimum |     |
|-------------------------------------------------------------------------------|---------|-----|
| STC                                                                           |         |     |
| Flexible (adjacency to Women/Men restroom)                                    | 60*     |     |
| Quiet (adjacency to Women/Men restroom)                                       |         | 60* |
| Office (private) (adjacency to Women/Men restroom)                            | 60*     |     |
| Meeting (adjacency to Office [private])                                       | 50*     |     |
| Flexible (adjacency to Media/Pre-Function/Corridor)                           |         | 45  |
| Quiet (adjacency to Storage/Office [shared/open])                             |         | 45* |
| Meeting (adjacency to Copy/Office [shared/open])                              |         | 45  |
| Conference                                                                    | 45      |     |
| Office (private) (adjacency to Plan/Office[private]/Office[shared/open]/Plan) |         | 45  |
| Fitness                                                                       | 45      |     |
| Toilet (private)                                                              | 45*     |     |

### 2. Interior Wall Types

- i) For STC 45 walls, partition should consist of two layers of 5/8", 2psf minimum gypsum board on one side of a single 3-5/8" steel stud with batt insulation in stud cavities and one layer of 5/8", 2psf gypsum board on the other side of the stud. This wall shall extend and seal to floor/roof deck above.
- ii) For STC 50 walls, partition should consist of two layers of 5/8", 2psf minimum gypsum board on both sides of a single 3-5/8" steel stud with batt insulation in stud cavities. This wall shall extend and seal to floor/roof deck above.

3. For STC 60 walls, partition should consist of two layers of 5/8", 2psf minimum gypsum board on both sides of double 3-5/8" steel studs (separated by 1/4" gap) with batt insulation in stud cavities. This wall shall extend and seal to floor/roof deck above.
4. Interior Floor Types and Finishes
  - i) To meet STC 45+ floor/ceiling composite construction at Levels 2 and 3, the floor structure should consist of a 3" minimum thickness of normal weight concrete and ceilings below should be ACT. At Levels 2 and 3; all offices (private and shared/open), open office circulation areas, and conference/meeting rooms should have carpet flooring to reduce noise/vibration from footfall and chair movement.
  - ii) At the Fitness room, a 1/2" wide slab isolation joint should be provided along the room perimeter and filled with resilient polyethylene foam. Minimal rebar dowels should cross the joint. Additionally, 1/2" thick rubber sports flooring should be provided within the Fitness room to reduce noise/vibration from weights, treadmills, etc.
5. Interior Doors
  - i) Same as Phase 6A.
6. Interior Windows
  - i) Same as Phase 6A.
7. Sealed Joints and Penetrations
  - i) Same as Phase 6A.
8. Workstation Furniture
  - i) To provide some, albeit limited, speech privacy at open workstations, furniture partitions should surround workstations on 3 sides with an opaque partition up to the height desired to interrupt sightlines but no higher than 51" above the floor. Above the opaque partitions, there should be glazing extending up to at least 60" above the floor. The interior side of opaque partitions above counter height should have 1" sound-absorbing panels.
9. Electronic Sound Masking (designed by others)
  - i) To provide additional speech privacy via steady-state background noise levels; Offices (private) should have electronic sound-masking systems operating at 40-42dBA and Office/Workspace/Copy/Plan/Workroom (shared/open) areas should have electronic sound-masking systems operating at 45-48dBA.

### C. BUILDING SERVICES NOISE

#### Noise Criteria

Room type NC levels not identified in the POR or ASHRAE Handbook are indicated with an asterisk (\*).

| Room Type                                | Maximum NC |
|------------------------------------------|------------|
| Flexible                                 | 30         |
| Conference                               | 35         |
| Meeting                                  | 35         |
| Office (private)                         | 35         |
| Office/Workspace/Copy/Plan (shared/open) | 35         |
| Quiet                                    | 35         |
| Workroom                                 | 40*        |
| Pre-Function                             | 40*        |
| Lounge/Reception                         | 40         |



|                        |     |     |
|------------------------|-----|-----|
| Kitchenette (open)     | 40  |     |
| Fitness                |     | 40* |
| Corridor               |     | 45  |
| Locker                 |     | 50* |
| Kitchenette (enclosed) | 50* |     |

1. Air Handling Units
  - i) Same as Phase 6A.
2. Heat Pumps
  - i) Same as Phase 6A.
3. VAV Terminal Units
  - i) VAV terminal units should be quiet-type (e.g., Price SDV) to minimize the extent of noise reduction measures necessary. VAV terminal units serving spaces with targets of NC-30 or less should be located outside the noise-sensitive space or outside the ceiling plenum of the noise-sensitive space.
4. Duct Distribution
  - i) Same as Phase 6A.
5. Duct Lining
  - i) Same as Phase 6A.
6. Flex Ducts
  - i) Same as Phase 6A.
7. Duct Sound Attenuators
  - i) Same as Phase 6A.
8. Routing of Piping
  - i) Mechanical and plumbing piping should not be routed through spaces with criteria of NC-30.
9. Vibration Isolation
  - i) Same as Phase 6A.
10. Transformer Sound Levels
  - i) Same as Phase 6A.
11. Electrical/Telecommunications Box Penetrations
  - i) Same as Phase 6A.

#### **Phase 8 - Storage Building (N/A)**



## Detailed Space List - Transit

| Program Number                                         | Priority | Space Name                     | Qty | Standard | Required Area | Requested Area | Excluded Area |
|--------------------------------------------------------|----------|--------------------------------|-----|----------|---------------|----------------|---------------|
| Office Spaces                                          |          |                                |     |          |               |                |               |
| OP151                                                  | A        | Office - Raod Supervisor       | 1   | 100 NASF | 100 NASF      |                |               |
| OP155-56                                               | A        | Station Clerk (2 Wkstns)       | 1   | 240 NASF | 240 NASF      |                |               |
| OP157                                                  | A        | Break                          | 1   | 60 NASF  | 60 NASF       |                |               |
| OP158                                                  | A        | Staff Toilet                   | 1   | 60 NASF  | 60 NASF       |                |               |
| Support Spaces                                         |          |                                |     |          |               |                |               |
| OP205                                                  | A        | Lost & Found Storeroom         | 1   | 180 NASF | 180 NASF      |                |               |
| OP206                                                  | A        | Merchandise Sales              | 1   | 30 NASF  | 30 NASF       |                |               |
| OP223                                                  | A        | Driver Lounge                  | 1   | 300 NASF | 300 NASF      |                |               |
| OP227                                                  | A        | Driver Kitchenette             | 1   | 80 NASF  | 80 NASF       |                |               |
| OP241-42                                               | A        | Station Driver Restroom        | 2   | 80 NASF  | 160 NASF      |                |               |
| OP251                                                  | A        | Station Lobby                  | 1   | 575 NASF | 575 NASF      |                |               |
| OP252                                                  | A        | Facilities Maintenance Storage | 1   | 180 NASF | 180 NASF      |                |               |
| OP253                                                  | A        | Mechanical / Electrical        | 1   | 150 NASF | 150 NASF      |                |               |
| OP254                                                  | A        | Restrooms (Men / Women)        | 2   | 180 NASF | 360 NASF      |                |               |
| OP255                                                  | A        | Janitor                        | 2   | 50 NASF  | 100 NASF      |                |               |
| TOTAL REQUIRED Operations Departmental Assigned Space  |          |                                |     |          | 2,575 NASF    |                |               |
| TOTAL REQUESTED Operations Departmental Assigned Space |          |                                |     |          |               | 0 NASF         |               |
| TOTAL EXCLUDED Operations Departmental Assigned Space  |          |                                |     |          |               |                | 0 NASF        |



## Detailed Space List - Administration & Facilities

| Program Number                   | Priority | Space Name                                       | Qty | Standard | Required Area | Requested Area | Excluded Area |
|----------------------------------|----------|--------------------------------------------------|-----|----------|---------------|----------------|---------------|
| Office Spaces - Administration   |          |                                                  |     |          |               |                |               |
| AD101-03                         | A        | Office - Executive Officers                      | 3   | 180 NASF | 540 NASF      |                |               |
| AD104                            | B        | Office - Future Executive Officer                | 1   | 180 NASF | 180 NASF      |                |               |
| AD112                            | A        | Office - Senior Project Manager                  | 1   | 120 NASF | 120 NASF      |                |               |
| AD105                            | A        | Workstation - Administrative Assistant           | 1   | 90 NASF  | 90 NASF       |                |               |
| AD106                            | B        | Workstation - Administrative Assistant           | 1   | 90 NASF  | 90 NASF       |                |               |
| AD107                            | B        | Small Meeting                                    | 1   | 213 NASF | 213 NASF      |                |               |
| AD108-09                         | B        | Future / Visit                                   | 2   | 60 NASF  | 120 NASF      |                |               |
| AD110                            | B        | Waiting                                          | 1   | 120 NASF | 120 NASF      |                |               |
| AD208                            | B        | Executive Storage / Future Office                | 1   | 120 NASF | 120 NASF      |                |               |
| Office Spaces - Projects         |          |                                                  |     |          |               |                |               |
| AD111                            | A        | Special Projects Mgr                             | 1   | 120 NASF | 120 NASF      |                |               |
| AD114-17                         | A        | Workstation - Capital Improvements               | 6   | 60 NASF  | 360 NASF      |                |               |
| AD118                            | A        | Office - Plan Room                               | 1   | 140 NASF | 140 NASF      |                |               |
| AD119                            | A        | Workstation - Visitor                            | 1   | 60 NASF  | 60 NASF       |                |               |
| Office Spaces - Rio Grande Trail |          |                                                  |     |          |               |                |               |
| RG101                            | A        | Office - RG Corridor Director                    | 1   | 120 NASF | 120 NASF      |                |               |
| RG102                            | B        | Workstation - Business Specialist                | 1   | 60 NASF  | 60 NASF       |                |               |
| Office Spaces - Human Resources  |          |                                                  |     |          |               |                |               |
| AD121                            | A        | Office - Human Resources Director                | 1   | 120 NASF | 120 NASF      |                |               |
| AD125                            | B        | Office - Future                                  | 1   | 120 NASF | 120 NASF      |                |               |
| AD122                            | A        | Manager                                          | 1   | 60 NASF  | 60 NASF       |                |               |
| AD123                            | A        | Management                                       | 1   | 60 NASF  | 60 NASF       |                |               |
| AD124                            | A        | Workstation - Human Resources Generalist         | 1   | 60 NASF  | 60 NASF       |                |               |
| AD126                            | A        | Workstation - Business Support Specialist        | 1   | 60 NASF  | 60 NASF       |                |               |
| AD127-29                         | B        | Workstation - Future Business Support Specialist | 3   | 60 NASF  | 180 NASF      |                |               |
| AD206                            | A        | File Storeroom (secure)                          | 1   | 60 NASF  | 60 NASF       |                |               |
| AD132                            | A        | Human Resources Waiting Area                     | 1   | 60 NASF  | 60 NASF       |                |               |
| Office Spaces - Finance          |          |                                                  |     |          |               |                |               |
| AD131                            | A        | Office - Finance Director                        | 1   | 120 NASF | 120 NASF      |                |               |
| AD132                            | A        | Office - Accounting Mgr                          | 1   | 120 NASF | 120 NASF      |                |               |
| AD133                            | A        | Office - Budget Mgr                              | 1   | 120 NASF | 120 NASF      |                |               |
| AD135                            | A        | Office - Payroll Specialist                      | 1   | 120 NASF | 120 NASF      |                |               |
| AD136                            | B        | Office - Future Office                           | 1   | 120 NASF | 120 NASF      |                |               |
| AD137-42                         | A        | Workstation - Finance Staff                      | 6   | 60 NASF  | 360 NASF      |                |               |
| AD143-44                         | A        | Workstation - Fare Clerks                        | 2   | 60 NASF  | 120 NASF      |                |               |
| AD145                            | A        | Workstation - Future Business Specialist         | 1   | 60 NASF  | 60 NASF       |                |               |
| AD146                            | B        | Workstation - Bullpen Meeting                    | 1   | 120 NASF | 120 NASF      |                |               |
| AD147                            | B        | Workstation - Future / Visit                     | 1   | 60 NASF  | 60 NASF       |                |               |
| AD148                            | A        | Secure Storage - Safe                            | 1   | 117 NASF | 117 NASF      |                |               |

| Program Number                         | Priority | Space Name                                    | Qty | Standard | Required Area | Requested Area | Excluded Area |
|----------------------------------------|----------|-----------------------------------------------|-----|----------|---------------|----------------|---------------|
| Office Spaces - Procurement            |          |                                               |     |          |               |                |               |
| AD151                                  | A        | Office - Procurement Manager                  | 1   | 120 NASF | 120 NASF      |                |               |
| AD153                                  | B        | Workstation - Procurement Specialist III      | 1   | 60 NASF  | 60 NASF       |                |               |
| AD154-56                               | A        | Workstation - Procurement Specialist          | 3   | 60 NASF  | 180 NASF      |                |               |
| AD157-58                               | A        | Workstation - Future / Visit                  | 2   | 60 NASF  | 120 NASF      |                |               |
| Office Spaces - Planning               |          |                                               |     |          |               |                |               |
| AD161                                  | A        | Office - Planning Director                    | 1   | 120 NASF | 120 NASF      |                |               |
| AD164                                  | A        | Workstation - Assistant Planner               | 1   | 60 NASF  | 60 NASF       |                |               |
| AD165                                  | B        | Workstation - Assistant Planner               | 1   | 60 NASF  | 60 NASF       |                |               |
| AD166                                  | B        | Workstation - Regional Transportation Planner | 1   | 60 NASF  | 60 NASF       |                |               |
| AD167                                  | A        | Workstation - Mobility Coordinator            | 1   | 60 NASF  | 60 NASF       |                |               |
| AD168                                  | B        | Workstation - Bullpen                         | 1   | 80 NASF  | 80 NASF       |                |               |
| AD169                                  | A        | Workstation - Corridor Transit Planner        | 1   | 60 NASF  | 60 NASF       |                |               |
| Office Spaces - Marketing              |          |                                               |     |          |               |                |               |
| AD171                                  | A        | Office - Marketing Communications Mgr         | 1   | 120 NASF | 120 NASF      |                |               |
| AD174                                  | A        | Workstation - Communications Specialist       | 1   | 60 NASF  | 60 NASF       |                |               |
| AD175                                  | A        | Workstation - Creative Comm. Associate        | 1   | 60 NASF  | 60 NASF       |                |               |
| AD176-177                              | A        | Workstation - Future / Visit                  | 2   | 60 NASF  | 120 NASF      |                |               |
| Office Spaces - Facilities Maintenance |          |                                               |     |          |               |                |               |
| FM101                                  | A        | Office - Facilities Director                  | 1   | 120 NASF | 120 NASF      |                |               |
| FM102                                  | A        | Office - Facilities Manager                   | 1   | 120 NASF | 120 NASF      |                |               |
| FM104                                  | A        | Office - Housing Manager                      | 1   | 120 NASF | 120 NASF      |                |               |
| AD130                                  | A        | Workstation - Housing Coordinator Coordinator | 1   | 60 NASF  | 60 NASF       |                |               |
| FM106-08                               | A        | Workstation - Business Specialists            | 3   | 60 NASF  | 180 NASF      |                |               |
| FM128-29                               | A        | Workstation - Visitors                        | 2   | 60 NASF  | 120 NASF      |                |               |
| FM130-31                               | B        | Workstation - Visitors                        | 2   | 60 NASF  | 120 NASF      |                |               |
| FM232                                  | A        | Facilities Maintenance Supplies Storeroom     | 1   | 180 NASF | 180 NASF      |                |               |
| Office Spaces - Technology             |          |                                               |     |          |               |                |               |
| FM151                                  | A        | Office - Technology Director                  | 1   | 120 NASF | 120 NASF      |                |               |
| FM152                                  | A        | Office - Technology Manager                   | 2   | 120 NASF | 240 NASF      |                |               |
| FM155-56                               | A        | Workstation - Network Admin                   | 2   | 60 NASF  | 120 NASF      |                |               |
| FM157                                  | A        | Workstation - Database Admin                  | 1   | 60 NASF  | 60 NASF       |                |               |
| FM158                                  | A        | Workstation - Data Analyst                    | 1   | 60 NASF  | 60 NASF       |                |               |
| FM160                                  | A        | Workstation - Cyber Security Mgr              | 1   | 60 NASF  | 60 NASF       |                |               |
| FM161                                  | A        | Workstation - Business Specialist             | 1   | 60 NASF  | 60 NASF       |                |               |
| FM162-63                               | A        | Workstation - Developer                       | 2   | 60 NASF  | 120 NASF      |                |               |
| FM164-65                               | A        | Workstation - Visitors                        | 2   | 30 NASF  | 60 NASF       |                |               |
| FM166-69                               | A        | Workstation - Systems Analyst                 | 4   | 60 NASF  | 120 NASF      |                |               |
| FM171                                  | A        | Help Desk Workroom (4 Wkstns)                 | 1   | 300 NASF | 300 NASF      |                |               |

| Program Number                                             | Priority | Space Name                                  | Qty | Standard | Required Area | Requested Area | Excluded Area |
|------------------------------------------------------------|----------|---------------------------------------------|-----|----------|---------------|----------------|---------------|
| Support Spaces                                             |          |                                             |     |          |               |                |               |
| AD201                                                      | A        | Reception Area                              | 1   | 240 NASF | 240 NASF      |                |               |
| AD202                                                      | A        | Copy / Work Room - Marketing                | 1   | 120 NASF | 120 NASF      |                |               |
| AD203A                                                     | A        | Copy / Work Room (2nd Flr)                  | 1   | 120 NASF | 120 NASF      |                |               |
| AD203B                                                     | A        | Executive Copy / Work Room (3rd Flr)        | 1   | 120 NASF | 120 NASF      |                |               |
| AD203C                                                     | A        | Copy / Work Room (3rd Flr)                  | 1   | 80 NASF  | 80 NASF       |                |               |
| AD209                                                      | A        | RFTA Store & Marketing Storage              | 1   | 120 NASF | 120 NASF      |                |               |
| AD211A                                                     | A        | Conference Room - Small (4-6) (2nd Flr)     | 1   | 180 NASF | 180 NASF      |                |               |
| AD211B                                                     | A        | Conference Room - Small (4-6) (2nd Flr)     | 1   | 150 NASF | 150 NASF      |                |               |
| AD211C                                                     | A        | Conference Room - Small (4-6) (3rd Flr)     | 1   | 150 NASF | 150 NASF      |                |               |
| AD216A                                                     | B        | Conference Room - Standard (8-10) (1st Flr) | 1   | 300 NASF | 300 NASF      |                |               |
| AD216B                                                     | B        | Conference Room - Standard (8-10) (2nd Flr) | 1   | 300 NASF | 300 NASF      |                |               |
| AD217                                                      | A        | Conference Room - Large (18-20)             | 1   | 480 NASF | 480 NASF      |                |               |
| AD221                                                      | A        | Multi-Purpose Room - Pre-Function           | 1   | 360 NASF | 360 NASF      |                |               |
| AD222                                                      | A        | Multi-Purpose Room - Flexible               | 1   | 980 NASF | 980 NASF      |                |               |
| AD223                                                      | A        | Multi-Purpose Room - Storeroom & Media      | 1   | 200 NASF | 200 NASF      |                |               |
| AD226-28                                                   | A        | Kitchenette                                 | 3   | 120 NASF | 360 NASF      |                |               |
| AD231                                                      | A        | Archive Record Storeroom                    | 1   | 180 NASF | 180 NASF      |                |               |
| AD234                                                      | B        | Fitness Room                                | 1   | 180 NASF | 180 NASF      |                |               |
| AD235                                                      | B        | Locker Room                                 | 1   | 150 NASF | 150 NASF      |                |               |
| AD236-37                                                   | B        | Shower                                      | 2   | 80 NASF  | 160 NASF      |                |               |
| AD238-39                                                   | A        | Waiting / Lounge                            | 2   | 135 NASF | 270 NASF      |                |               |
| AD241-43                                                   | A        | Restrooms (Men/Women)                       | 3   | 360 NASF | 1,080 NASF    |                |               |
| FM523-26                                                   | A        | Housekeeping Closet - Admin                 | 3   | 80 SF    | 240 SF        |                |               |
| FM541                                                      | A        | MDF                                         | 1   | 120 SF   | 120 SF        |                |               |
| FM542-543                                                  | A        | IDF                                         | 2   | 120 SF   | 240 SF        |                |               |
| FM544                                                      | A        | Mechanical Room                             | 1   | 200 SF   | 200 SF        |                |               |
| FM545                                                      | A        | Electrical Room - Distribution              | 1   | 200 SF   | 200 SF        |                |               |
| FM546-548                                                  | A        | Electrical Room - Satellite                 | 3   | 80 SF    | 240 SF        |                |               |
| TOTAL REQUIRED Administration Departmental Assigned Space  |          |                                             |     |          | 16,030 NASF   |                |               |
| TOTAL REQUESTED Administration Departmental Assigned Space |          |                                             |     |          |               | 0 NASF         |               |
| TOTAL EXCLUDED Administration Departmental Assigned Space  |          |                                             |     |          |               |                | 0 NASF        |



April 17, 2000



Enhanced In Situ Bioremediation  
Using "BioLuxing" Technology

Mr. Walter Avramenko  
Hazardous Waste Cleanup Unit Leader  
Colorado Department of Public Health and Environment  
HMWMD-HWC-B2  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530

FSI#97009

**Re: Results of Semiannual Groundwater Monitoring. Progress Report on voluntary cleanup at the former EIMCO facility in Glenwood Springs, Colorado. Request for No Further Action Letter and Well Closure**

Dear Mr. Avramenko:

On April 27, 1999, FOREMOST Solutions, Inc. (FSI) proposed a plan for a voluntary cleanup of the former EIMCO facility in Glenwood Springs, Colorado. Your office provided comments and approved of the plan on May 20, 1999. The plan was subsequently put into operation. This document provides a progress report on that project which we are submitting for our client, Glenwood Industrial, LLC. It also provides the results of semiannual groundwater monitoring during June and December 1999, and it makes a request for well closure and a "No Further Action" letter from your office. We would appreciate your review and receipt of any comments you might have regarding this report and on our request.

**EXECUTIVE SUMMARY**

Semiannual groundwater monitoring continues to show that the concentrations of total dissolved chromium are below the Colorado Drinking Water Standard at the down gradient Monitoring Well 5 (MW-5). Concentrations of total dissolved chromium at this location have been below the Federal Drinking Water standard for the past two years and at or below the Colorado Standard for the past year during both high and low water level periods. In June 1999, concentrations were below the Colorado Standard in all wells on the property except for MW-3, which at 0.12 mg/l was only slightly above the Federal Standard of 0.10 mg/l. Semiannual groundwater monitoring in December, 1999 showed that all wells were at or below 0.02 mg/l which is well below the Colorado Standard of 0.05 mg/l. These results indicate that chromium contamination from the site is no longer impacting the down gradient water quality. Consequently, FSI requests that the Colorado Department of Public Health and Environment (CDPHE) approve well closure and issue a letter of No Further Action for this site.

The June 1999 sampling did indicate that small amounts of chromium were still continuing to leach from under the building during high groundwater periods. This impact is seen as an increase at MW-3. In order to minimize this localized impact, Glenwood Industrial LLC decided to install a treatment system that would remove residual amounts of soluble chromium that might be trapped under the building so that it could no longer contribute groundwater impacts during high water periods.

A combined chemical and biochemical recirculation system was designed by FSI for this purpose. The system was approved by CDPHE and placed into operation between July and December 1999.



Groundwater monitoring from wells downgradient of the former plating operation showed that measurable amounts of dissolved chromium were flushed from under the building by the remediation system. Contaminated groundwater was removed from MW-3 and discharged into a treatment/infiltration trench near the location of the former plating pit. A bioremediation matrix in the trench was design to provide reducing conditions that would precipitate the soluble chromium in the recirculated groundwater. This system was augmented with the addition of a chemical reducing agent, calcium polysulfide, in order to speed the establishment of reducing conditions and to minimize soluble chromium bypassing the treatment system and going to the Colorado River.

The combined treatment system proved to be successful in removing soluble chromium from under the warehouse building. Active pumping of groundwater was suspended in December when the levels in all wells had dropped to below the Colorado Standard or to nearly pretreatment conditions. Testing of groundwater in down gradient wells in March 2000 verified that chromium concentrations continue to stay below the Colorado Standard.

## **BACKGROUND**

The former EIMCO Coal Machinery, Inc. facility located at 2222 Devereux Road, Glenwood Springs, Colorado was a suspected source for low levels of hexavalent chromium contamination in groundwater. According to file records, this company performed chromium plating of mining tools at this facility until 1992. The plating was conducted in tanks that were located in a concrete-block pit along the South side of the warehouse building. A site assessment of the property in 1992 showed that the only contaminant of concern was chromium that was present in soil under the pit. Apparently, leakage of aqueous chromium solutions from the pit area had led to hexavalent chromium contamination in the soil under the building. The pit and some of the adjacent soils were subsequently removed.

Monitoring of groundwater at the site has shown that groundwater moves in a north-northwest direction (**Figure 1**) and that hexavalent chromium contamination continues to persist under the building. Groundwater flowing under the building continued to exhibit low levels of hexavalent chromium contamination in MW-3 especially during high water table conditions. The chrome concentrations are lowest when the groundwater levels are lowest, i.e. in December and highest when the groundwater levels rise, i.e. in June. The attached **Table 1** summarizes the levels of chrome in groundwater samples from the site between July 1992 and December 1998. The concentrations have continued to decline over time and were nearing State and Federal standards in 1998. Groundwater from the farthest down gradient monitoring well (MW-5) was below the State Standard in December 1998.

## **CURRENT SITUATION**

In April 1999, the EIMCO property was sold to Glenwood Industrial, LLC (P.O. Box 1150 in Glenwood Springs, Colorado 81602) who subsequently engaged FOREMOST Solutions, Inc. (FSI) to provide technical consultation and site remediation. All correspondence regarding these activities should be sent to FSI at 350 Indiana Street, Suite 415, Golden, CO 80401.

The CDPHE had required EIMCO to test groundwater at the site. EIMCO did this on a quarterly basis between 1993 and 1997. Since 1997, this testing has been done on a semi-annual basis.

FSI's evaluation of the site led to the conclusion that residual amounts of hexavalent chromium were still trapped in the pore spaces of the soil under the building and former pit area. Whenever the groundwater would rise, some of this chromium would be mobilized and carried to the downstream monitoring wells MW-3 and MW-5 and then into the Colorado River. The levels of chromium contamination observed at these wells continued to decline over the years. In June 1998 chromium concentrations were below both Federal and State groundwater standards at all wells but MW-3 where the concentration of total dissolved chromium was 0.25 mg/l. In December 1998, all groundwater monitoring wells were below the Colorado Standard of 0.05 mg/l.

On June 29, 1999, the concentration of total dissolved chromium was below the Colorado Standard for all wells except MW-3 where the concentration was 0.12 mg/l. This is very close to the Federal Standard of 0.10 mg/l and only twice the Colorado Standard. However, both Glenwood Industrial and CDPHE would like to see a permanent solution to this problem and a certification of "no further action" from the State. Consequently, Glenwood Industrial requested FSI to install and operate a remediation system that would remove residual soluble chromium from the vadose zone under the building and thereby minimize the potential for periodic contamination of the groundwater when the water table would rise.

## **REMEDIATION SYSTEM**

FSI proposed to install a recirculating anaerobic bioremediation system that would reduce the highly water soluble hexavalent chromium to insoluble trivalent chromium. The system relied on 1) bioremediation of natural organic matter to provide the reducing conditions for chromium and 2) on the addition of a chemical reducing agent to enhance the reducing conditions. This system was constructed in May 1999 and placed into operation in July 1999.

### **Bioremediation System**

A plan view of the system is shown in **Figure 1A**. A side view of the system is shown in **Figure 2**. The system was designed to flush soluble chromium from under the warehouse building and former plating pit. This soluble chromium was then collected by a downstream pumping well and discharged into an anaerobic bioremediation matrix located in a treatment/infiltration (T/I) trench above the former plating pit. The system was designed so that soluble hexavalent chromium would be reduced to the insoluble trivalent chromium in the anaerobic environment of the trench.

Soluble components of the natural organic materials in the bioremediation matrix are carried with the recirculated groundwater that infiltrates into the soil under the building. A portion of the chromium under the building would be reduced as it reacts with these soluble organic components. The reduced chromium precipitates and remains fixated as insoluble trivalent chromium in the soil pore spaces under the building. This reduces the amount of soluble chromium that will have to be recirculated through the treatment system and speeds the time required to remove soluble chromium from the groundwater.

### **Chemical Fixation System**

Dilute aqueous solutions of a water-soluble chemical reducing agent (calcium polysulfide) were added to the groundwater and the bioremediation system after several months in order to speed the establishment of the necessary reducing conditions and further decrease the time required for treatment.

### **RULE AUTHORIZATION**

An application for a Class V Injection Well Rule Authorization was made to the U.S. Environmental Protection Agency (US EPA) for the recirculation of groundwater at the site and for the injection of aqueous solutions of calcium polysulfide. This application was approved by D. Edwin Hogle, Director of the Groundwater Program, US EPA, Region 8, and FSI was notified by letter on July 30, 1999.

### **SYSTEM INSTALLATION**

A diagram of the remediation system is shown in **Figure 1A**. The recirculation line trench extends from MW-3 along the West and South sides of the building to the T/I trench, a total of about 150 ft. in length. The T/I trench was located as close to the former plating pit as possible. The recirculation line and the distribution line in the T/I trench were constructed of 1 in. Schedule 40 PVC pipe with 0.02 in. slots. The distribution line was slotted on one side. A 2 in. slotted riser was installed in the center of the T/I trench to observe the water level in the trench.

A Perc Test was performed to measure the rate of water infiltration or percolation into the near surface soils for the construction of a septic system on the property. The Perc Test provided an estimate of percolation rate through the bottom of the T/I trench and allowed FSI to appropriately size a submersible pump for the treatment system. A submersible pump was installed in MW-3 and connected to the recirculation line along with a three-way valve for water sampling and drainage.

### **T/I TRENCH AND BIOREMEDIATION MATRIX**

The T/I trench was 20 ft long, 2 ft. wide and 4 ft. deep. The sides of the trench and the bioremediation matrix were covered with black plastic sheeting to reduce water losses to the sides, retain heat, minimize oxygen infusion and to help maintain anaerobic conditions. The bottom 2.5 ft. of the trench was filled with about 100 cubic ft. of the Bioremediation Matrix.

The Bioremediation Matrix was made up of porous ceramic diatomaceous earth pellets (Isolite® CG-6) and dry, pulverized cow manure, about 70/30 by volume. The manure provided a natural rich organic and nutrient material with a high microbial population. The Isolite provided a good matrix for the bacteria and allowed adequate water flow through the fine-grained manure. A cross section of the T/I trench is shown in **Figure 3**.

An access pipe was installed in the center of the T/I trench so that calcium polysulfide solutions could be added to the bottom of the trench.

A float switch was used to control the submersible pump and the level of water in the T/I trench.

## SYSTEM OPERATION

The submersible pump was operated at a frequency that would keep the T/I trench filled with about 2.5 ft. of water. The system was turned on and off on a regular basis to assure that overflow did not occur.

## GROUNDWATER MONITORING

FSI continued with the collection of groundwater samples from the monitoring wells on the site and arranged for them to be tested at Evergreen Analytical Laboratories for Total Dissolved Chromium according to Standard US EPA procedures. During operation of the treatment system, samples from the recirculation system at MW-3 were tested on a monthly basis. Samples were also tested from MW-2 and MW-4 to see if the system flushed any soluble chromium into these areas. The results of these analyses are shown in **Table 2**. Laboratory test reports are attached in **Appendix A**. FSI periodically made water level measurements and these results are shown in **Table 3**.

## RESULTS OF TREATMENT SYSTEM OPERATION

Concentrations of total dissolved chromium at all monitoring wells were at or below the Colorado Standard of 0.05 mg/l in December 1998. During the semiannual groundwater sampling in June 1999 all monitoring wells were below the Colorado Standard except for MW-3 where the concentration of 0.12 mg/l was only slightly above the Federal Standard of 0.1 mg/l. The water table at this time was relatively high at 26.1 ft. bgs in MW-3. The remediation system was placed into operation after the semiannual sampling.

Groundwater samples from MW-2 and MW-3 were tested after the remediation system was in operation for several weeks. MW-2 is closer to the location of the former plating area than MW-3, and it showed the first effects of the recirculation system. At this time, MW-2 had a concentration of 0.36 mg/l while MW-3 was unchanged at 0.11 mg/l. As anticipated, the recirculated groundwater was seeping through the Vadose zone and pushing before it some quantity of chromium contaminated water that had been trapped in the pore spaces above the water table. These two wells were tested again in September and the results showed that the concentrations in MW-2 were dropping as the front moved past, and the concentrations in MW-3 were increasing as the front arrived at this down gradient location. The groundwater level at this time had dropped to about 31.5 ft. bgs at MW-3, and stayed at this level through the end of December 1999. The groundwater level started to rise again in April 2000 (**Table 3**).

MW-2, MW-3 and MW-4 were tested in October. This testing showed no significant contamination at MW-4. However, the concentrations at MW-2 and -3 were relatively unchanged at about 0.25 mg/l. Higher concentrations in MW-3 were not of concern since this water was being pumped back up gradient to the infiltration trench for treatment. However we were concerned that some of the groundwater that passed MW-2 might not be captured by the recirculation system and could flow to the Colorado River. Consequently, we decided to begin the chemical treatment at this time in order to reduce this possibility.



Approximately 200 gallons of a 1% by volume aqueous calcium polysulfide (CPS) solution were added to MW-2 and MW-4, and about 800 gallons were added to the bottom of the T/I trench. The purpose of the CPS was to quickly establish anaerobic or reducing conditions that would fixate any soluble chromium at these locations. This process proved to be successful. Testing of MW-2 and MW-4 in November showed concentrations at or below the Colorado Standard, whereas MW-3 that had no CPS added showed a slight drop to 0.23 mg/l. These wells were tested again in early December and the concentrations of total dissolved chromium then were at or below the detection limit of 0.01 mg/l, and the concentrations at MW-3 had continued to drop to 0.18 mg/l. This drop was indicative that treated water was now reaching MW-3 and that the front of contaminated water had been pumped to the treatment system. Consequently, we decided to stop active recirculation of groundwater at this time in order to allow time for the treated water to drain from the vadose zone and the groundwater levels to return to their natural condition. An additional treatment of CPS was provided at this time to assure that reducing conditions would be maintained in the subsurface.

The semiannual groundwater sampling was performed three weeks later on December 30, 1999. At this time, all monitoring wells were below the Colorado Standard of 0.05 mg/l. In fact, all were at or below 0.02 mg/l. The three monitoring wells closest to the warehouse were sampled again in March 2000. These test results verified that soluble chromium concentrations continue to stay below the Colorado Standard.

## **CONCLUSIONS**

In summary, a combined chemical and biochemical treatment system was installed to remove soluble chromium that had been trapped under the warehouse building. The treatment system was operated until the concentration of chromium in the recirculated groundwater was near pretreatment levels. The treatment system was shown to be successful at removing soluble chromium contamination from groundwater. Testing of down gradient monitoring wells confirmed that essentially all residual soluble chromium has been removed from the system. The calcium polysulfide solution treatment effectively reduced total dissolved chromium concentrations in groundwater to below the Colorado Standard.

Semiannual groundwater monitoring has continued to show that the concentrations of total dissolved chromium are below the Colorado Standard down gradient of the site at MW-5. Concentrations of total dissolved chromium at this location have been below the Federal Standard for the past two years and were at or below the Colorado Standard for the past year and a quarter during both high and low water level periods. These results indicate that chromium from the site is no longer impacting the down gradient water quality. Groundwater monitoring three months after the treatment system was shut down showed that soluble chromium concentrations continue to stay well below the Colorado Standard.

## **REQUEST FOR SITE CLOSURE**

FSI requests closure for this site on the basis that 1) residual soluble chromium has been removed from under the warehouse and no longer poses a threat to down gradient water systems, 2) down gradient groundwater is no longer impacted by the site and 3) this groundwater has continued to stay well below the Colorado Standard for over a year.

FSI requests CDPHE to issue a "No Further Action" letter for the site and approve the closure of the five groundwater monitoring wells at the site. FSI proposes to close these wells by removing the top three ft. of casing and filling the remaining casing with sand and high solids bentonite or cement grout. The ground surface will be restored to its pre-well condition.

FSI would appreciate your review and comments regarding this report and our requests.

Sincerely,  
FOREMOST Solutions, Inc.



Theodore O. Meiggs, Ph.D.  
Vice President & General Manager

Attachments: Figures 1A, 1-3  
Tables 1-3  
Appendix A

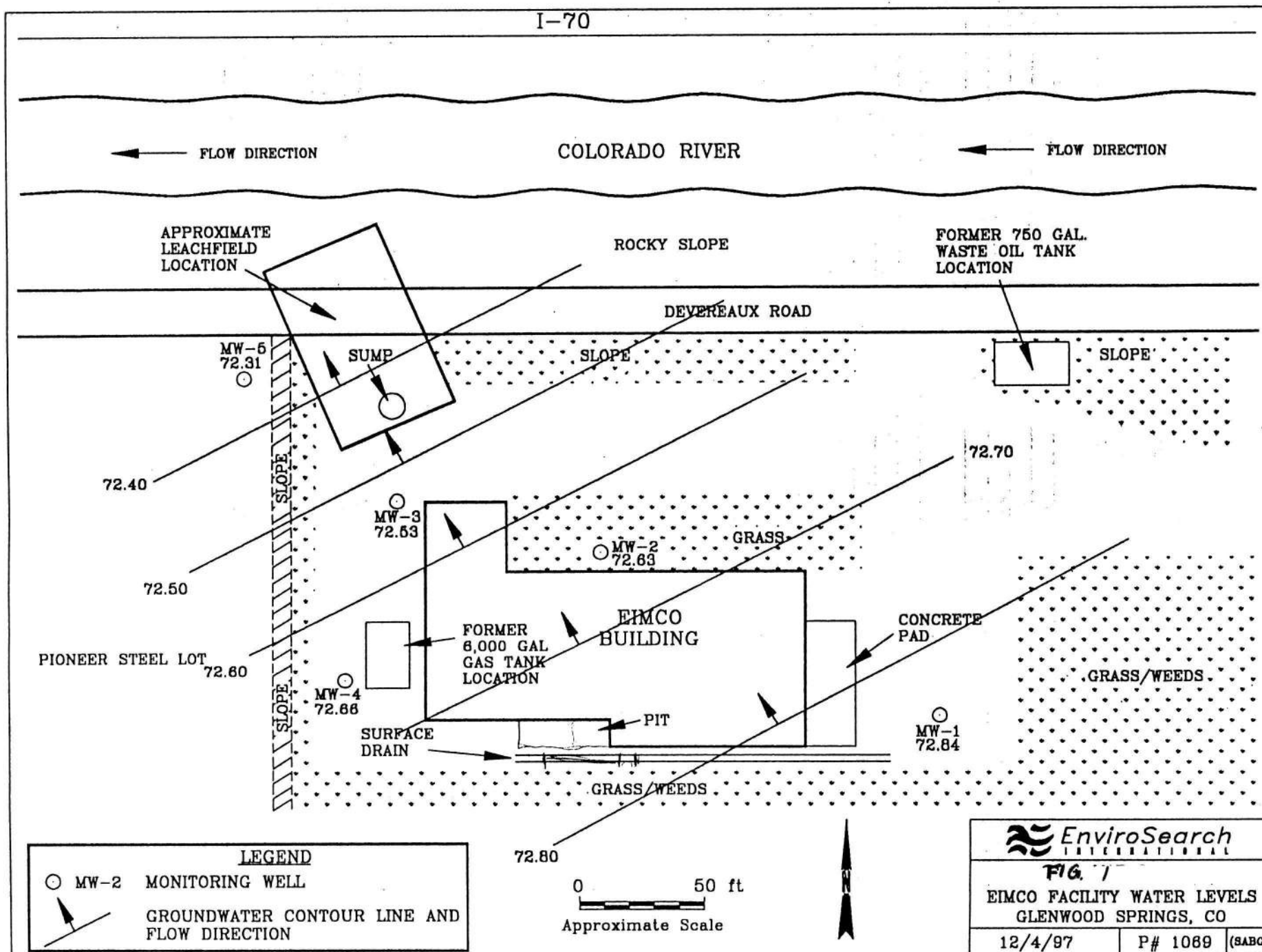
cc. Mr. Gary Schultz, Glenwood Industrial, LLC  
Ms. Valois Shea, U.S. Environmental Protection Agency, Region 8

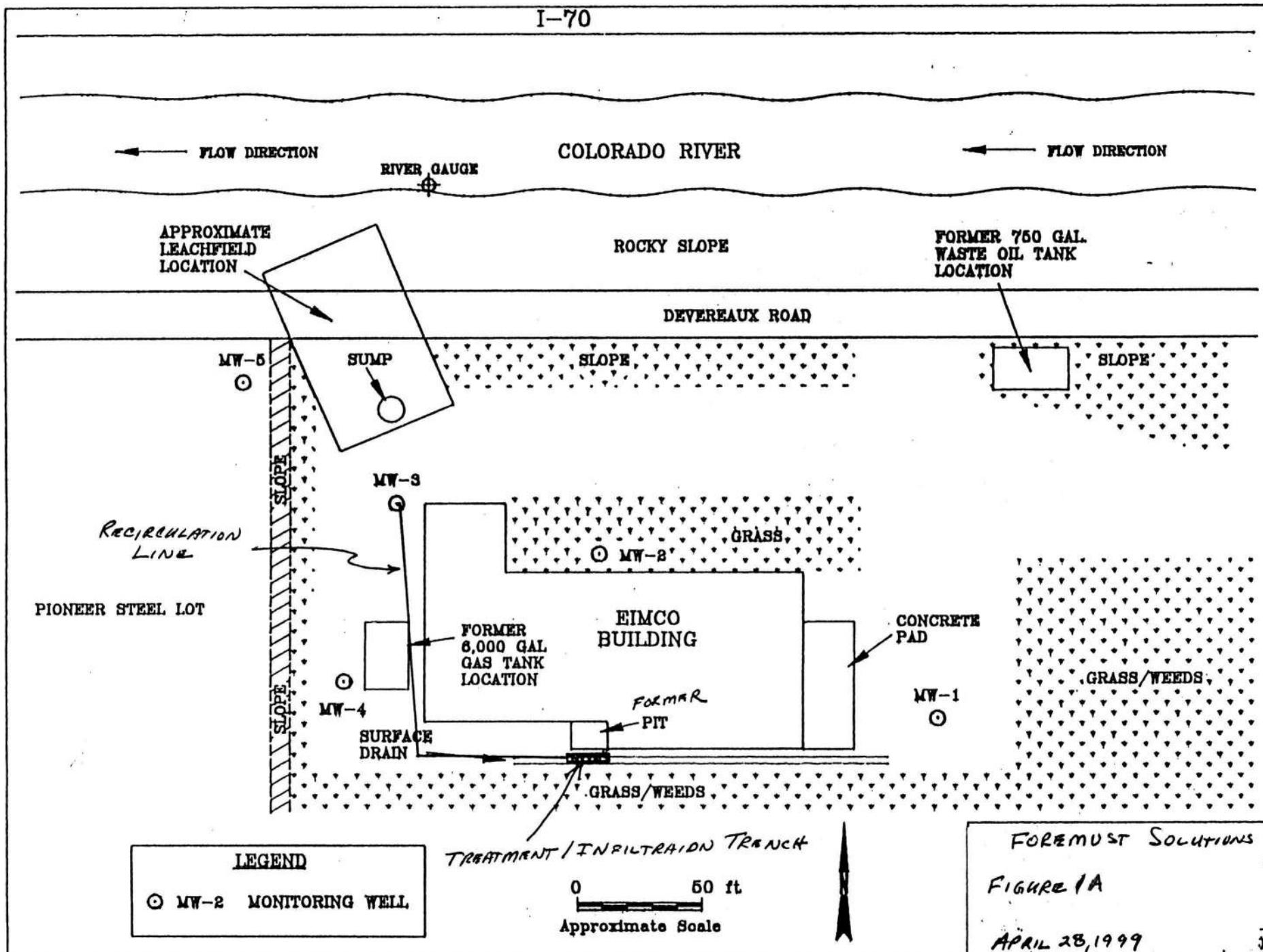


**Table 1: July 1992 to December 1998**  
**Summary of Analytical Results for Groundwater Samples (mg/l)**  
**Glenwood Industrial, LLC Facility, Glenwood Springs, Colorado**

| <u>Date</u>       | <u>Parameter</u>                | <u>MW-1</u> | <u>MW-2</u> | <u>MW-3</u> | <u>MW-4</u> | <u>MW-5</u> |
|-------------------|---------------------------------|-------------|-------------|-------------|-------------|-------------|
| July, 1992        | Total Dissolved Chromium (mg/l) | 0.033       | <0.010      | 0.014       | NA          | NA          |
| April 15, 1993    | "                               | <0.010      | <0.010      | 0.041       | <0.010      | NA          |
| February 14, 1994 | "                               | 0.03        | <0.02       | 0.09        | <0.020      | NA          |
| May 11, 1994      | "                               | 0.03        | <0.020      | 1.09        | <0.020      | NA          |
| June 9, 1994      | "                               | <0.010      | 0.02        | 0.64        | <0.010      | NA          |
| October 1, 1994   | "                               | <0.020      | 0.08        | 0.09        | <0.020      | NA          |
| March 21, 1995    | "                               | <0.020      | 0.11        | 0.14        | <0.020      | NA          |
| June 7, 1995      | "                               | <0.010      | 0.012       | 0.992       | <0.010      | NA          |
| September 7, 1995 | "                               | <0.005      | 0.052       | 0.325       | 0.029       | NA          |
| December 28, 1995 | "                               | <0.010      | 0.047       | 0.096       | <0.010      | NA          |
| March 14, 1996    | "                               | <0.005      | 0.018       | 0.165       | <0.005      | NA          |
| June 27, 1996     | "                               | 0.009       | 0.014       | 0.502       | 0.014       | NA          |
| October 9, 1996   | "                               | NA          | NA          | NA          | NA          | 0.174       |
| December 16, 1996 | "                               | <0.005      | 0.035       | 0.103       | <0.005      | 0.09        |
| June 4, 1997      | "                               | <0.005      | <0.005      | 0.785       | 0.007       | 0.135       |
| December 4, 1997  | "                               | <0.005      | 0.013       | 0.071       | <0.005      | 0.093       |
| June 8, 1998      | "                               | <0.005      | <0.005      | 0.248       | <0.005      | 0.074       |
| December 8, 1998  | "                               | <0.005      | 0.006       | 0.049       | <0.005      | 0.05        |

Note: Federal Drinking Water Standard for Total Dissolved Chromium is 0.10 mg/l  
Colorado Drinking Water Standard for Total Dissolved Chromium is 0.05 mg/l





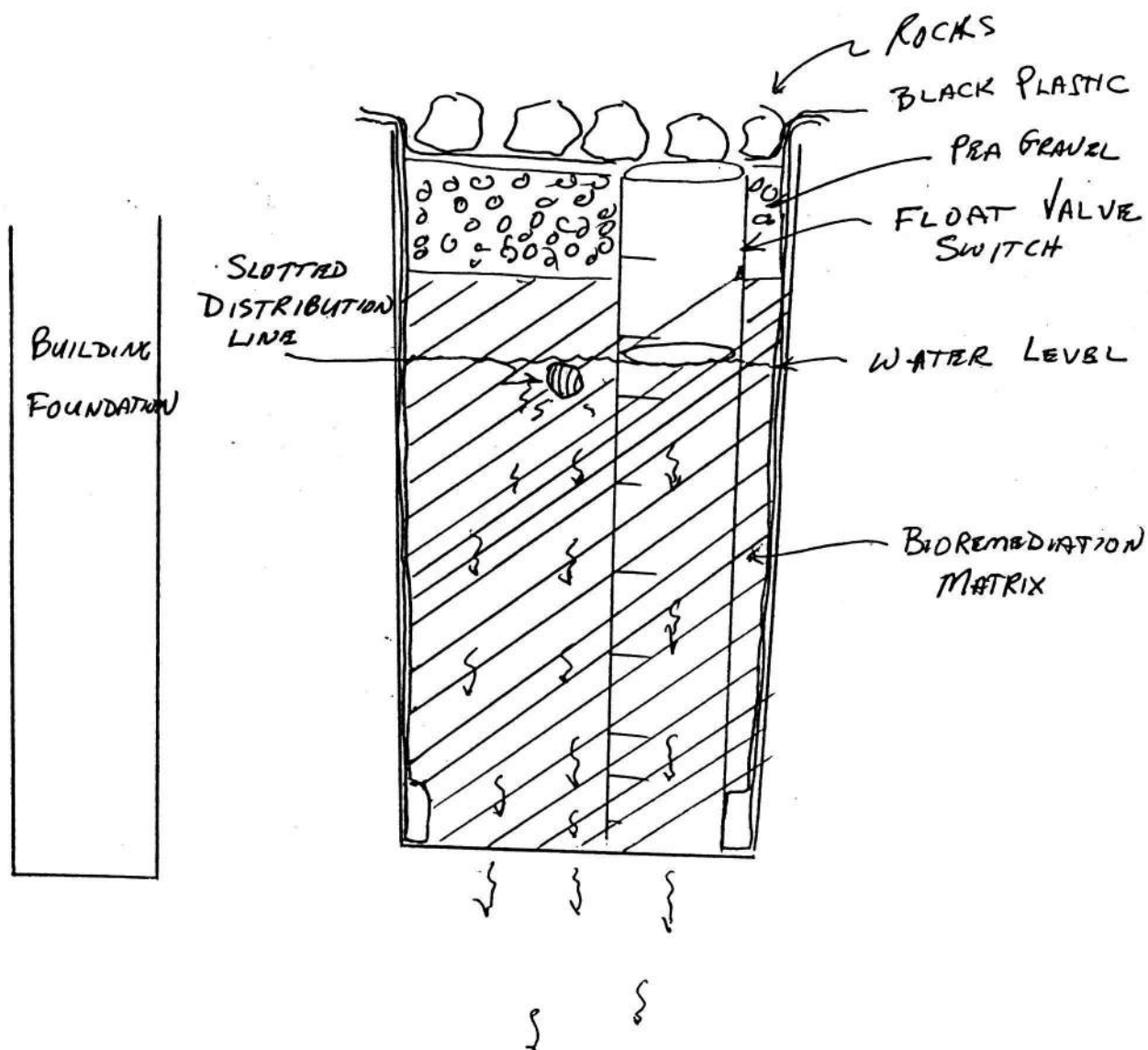


FIGURE 3 ANAEROBIC BIOTREATMENT TRENCH

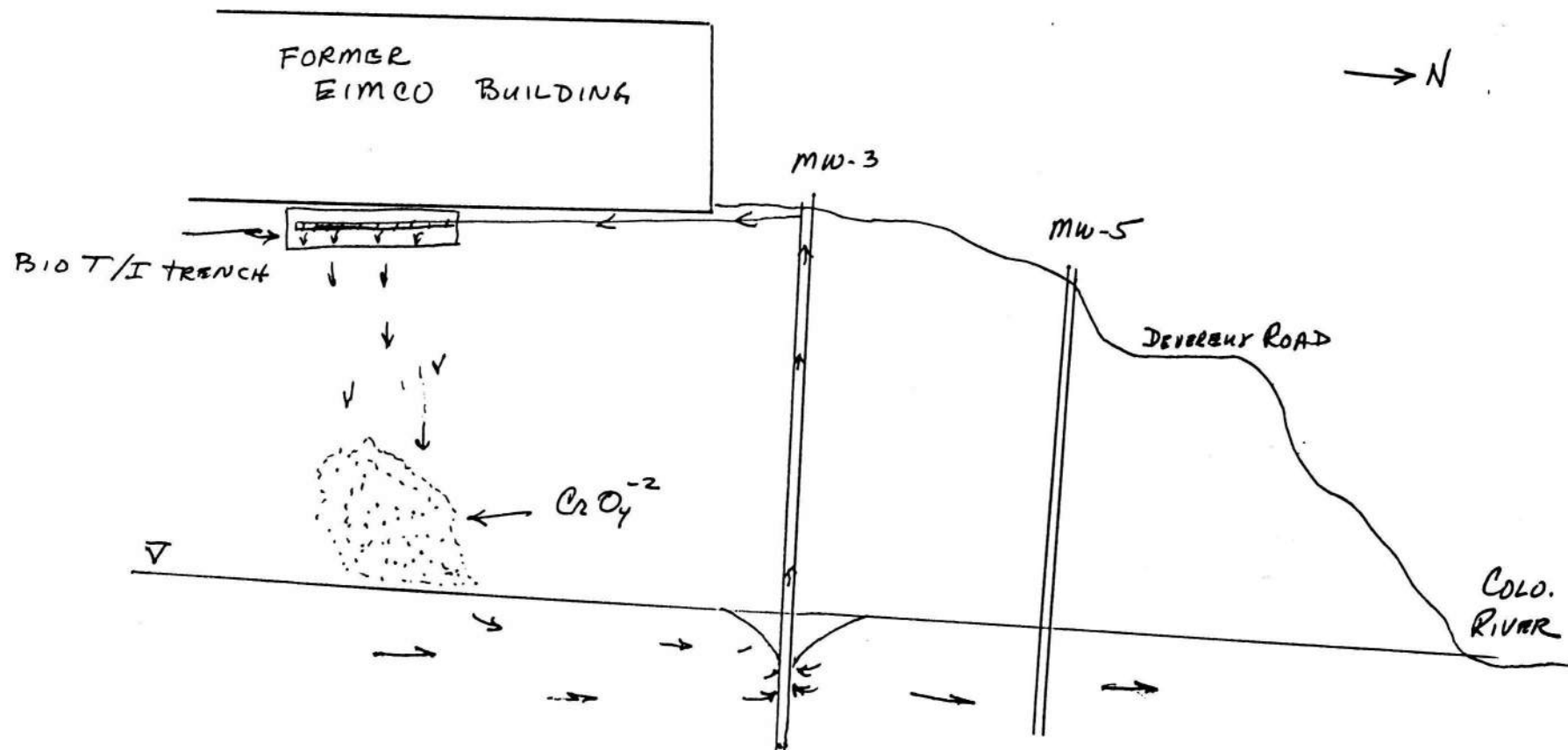


FIGURE 2 SIDE VIEW OF RECIRCULATION SYSTEM AND TREATMENT/ INFILTRATION TRENCH. (NOT TO SCALE MW-3 IS 40 FT. DEEP) GROUND WATER VARIES FROM 21-31 FT. DEEP

**Table 2: June 1999 to March 2000****Summary of Analytical Results for Groundwater Samples (mg/l)  
Glenwood Industrial, LLC Facility, Glenwood Springs, Colorado**

| <u>Date</u>                         | <u>Parameter</u>          | <u>MW-1</u> | <u>MW-2</u> | <u>MW-3</u> | <u>MW-4</u> | <u>MW-5</u> |
|-------------------------------------|---------------------------|-------------|-------------|-------------|-------------|-------------|
| June 29, 1999                       | Total Dissolved Cr (mg/l) | <0.002      | <0.002      | 0.12        | <0.002      | <0.002      |
| <b>Operate Recirculation System</b> |                           |             |             |             |             |             |
| July 31, 1999                       | "                         | NA          | 0.36        | 0.11        | NA          | NA          |
| September 2, 1999                   | "                         | NA          | 0.16        | 0.24        | NA          | NA          |
| October 1, 1999                     | "                         | NA          | 0.24        | 0.26        | <0.05       | NA          |
| <b>Chemical Treatment</b>           |                           |             |             |             |             |             |
| November 9, 1999                    | "                         | NA          | 0.03        | 0.23        | 0.06        | NA          |
| December 7, 1999                    | "                         | NA          | <0.01       | 0.18        | 0.01        | NA          |
| <b>Chemical Treatment</b>           |                           |             |             |             |             |             |
| December 30, 1999                   | "                         | <0.02       | <0.02       | <0.02       | <0.02       | 0.02        |
| March 23, 2000                      | "                         | NA          | 0.02        | <0.02       | <0.02       | NA          |

Note: Federal Drinking Water Standard for Total Dissolved Chromium is 0.10 mg/l  
Colorado Drinking Water Standard is 0.05 mg/l



**Table 3: June 1999 to April 2000**  
**Summary of Water Level Measurements**  
**Glenwood Industrial, LLC Facility, Glenwood Springs, Colorado**

| <u>Date</u> | <u>Parameter</u>       | <u>MW-1</u> | <u>MW-2</u> | <u>MW-3</u> | <u>MW-4</u> | <u>MW-5</u> |
|-------------|------------------------|-------------|-------------|-------------|-------------|-------------|
| 29-Jun-99   | Water Level (feet bgs) | 25.1        | 25.8        | 26.1        | 24.8        | 17.9        |
| 31-Jul-99   | "                      | NA          | NA          | NA          | NA          | NA          |
| 2-Sep-99    | "                      | NA          | 31.0        | 31.6        | NA          | NA          |
| 5-Oct-99    | "                      | NA          | 30.5        | 32.3        | 29.5        | NA          |
| 12-Dec-99   | "                      | NA          | 31.4        | 31.5        | 30.1        | NA          |
| 30-Dec-99   | "                      | 30.9        | 31.6        | 31.7        | 30.3        | 23.8        |
| 5-Apr-00    | "                      | 30.7        | 31.3        | 31.4        | 30.0        | 23.0        |

**APPENDIX A**  
**ANALYTICAL REPORTS**

**Chromium**  
**ICP-MS ,200.8, Dissolved**

Method Number : E200.8

Date Received : 06/30/1999

Date Prepared : 07/01/1999

Client Project ID :

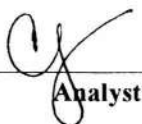
Lab Work Order : 99-3168

Units : mg/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 99-3168-01A   | MW-1             | Groundwater   | 06/29/1999  | 07/07/1999    | 1               | 0.0096 B      | 0.0014          |
| 99-3168-02A   | MW-3             | Groundwater   | 06/29/1999  | 07/07/1999    | 1               | 0.12 B        | 0.0014          |
| 99-3168-03A   | MW-2             | Groundwater   | 06/29/1999  | 07/07/1999    | 1               | 0.015 B       | 0.0014          |
| 99-3168-04A   | MW-4             | Groundwater   | 06/29/1999  | 07/07/1999    | 1               | 0.013 B       | 0.0014          |
| 99-3168-05A   | MW-5             | Groundwater   | 06/29/1999  | 07/07/1999    | 1               | 0.0055 B      | 0.0014          |
| MB-4781       |                  |               |             | 07/07/1999    | 1               | 0.006         | 0.0014          |

**Qualifiers:**

U - Not Detected at the Reporting Limit  
E - Reported concentration above quantitation range  
S - Spike recovery outside accepted recovery limits  
B - Analyte detected in the associated Method Blank

  
Analyst

  
Approved

07/19/1999 3:11:29 PM

**EVERGREEN ANALYTICAL, Inc.**  
4036 Youngfield St. Wheat Ridge, CO 80033  
(303) 425-6021

**Analysis Report**

Date Sampled : 06/29/99  
Date Received : 06/30/99  
Date Prepared : 06/30/99  
Date Analyzed : 06/30/99

Client : Foremost Solutions  
Lab Project Number : 99-3168  
Matrix : Water  
Method : EPA 150.1

| <u>Evergreen<br/>Sample #</u> | <u>Client<br/>Sample I.D.</u> | <u>pH</u> |
|-------------------------------|-------------------------------|-----------|
| 99-3168-01                    | MW-1                          | 7.30      |
| 99-3168-02                    | MW-2                          | 7.30      |
| 99-3168-03                    | MW-3                          | 7.71      |
| 99-3168-04                    | MW-4                          | 7.39      |
| 99-3168-05                    | MW-5                          | 7.48      |

  
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Analyst

  
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Approved

**Chromium**  
**ICP-MS ,200.8, Dissolved**

Method Number : E200.8

Date Received : 08/05/1999

Date Prepared : 08/13/1999

Client Project ID : 97009

Lab Work Order : 99-3855

Units : mg/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 99-3855-01A   | #1 MW-2          | Groundwater   | 07/31/1999  | 08/17/1999    | 1               | 0.36          | 0.0014          |
| 99-3855-02A   | #2 MW-3          | Groundwater   | 07/31/1999  | 08/17/1999    | 1               | 0.11          | 0.0014          |
| MB-5061       |                  |               |             | 08/17/1999    | 1               | U             | 0.0014          |

**Qualifiers:**

U - Not Detected at the Reporting Limit  
E - Reported concentration above quantitation range  
S - Spike recovery outside accepted recovery limits  
B - Analyte detected in the associated Method Blank



Analyst



Approved

8/19/1999 11:20:23 AM

**Chromium**  
**ICP-MS ,200.8, Dissolved**

**Method Number** : E200.8

**Date Received** : 09/03/1999

**Date Prepared** : 09/07/1999

**Client Project ID** : Glenwood Industrial

**Lab Work Order** : 99-4451

**Units** : mg/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 99-4451-01A   | MW2              | Groundwater   | 09/02/1999  | 09/08/1999    | 1               | 0.16          | 0.0014          |
| 99-4451-02A   | MW3              | Groundwater   | 09/02/1999  | 09/08/1999    | 1               | 0.24          | 0.0014          |
| MB-5216       |                  |               |             | 09/08/1999    | 1               | U             | 0.0014          |

**Qualifiers:**

U - Not Detected at the Reporting Limit  
E - Reported concentration above quantitation range  
S - Spike recovery outside accepted recovery limits  
B - Analyte detected in the associated Method Blank

  
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Analyst

  
\_\_\_\_\_  
Approved



Evergreen Analytical, Inc.  
4036 Youngfield St., Wheat Ridge, CO 80033  
(303) 425-6021

**Chromium**  
**ICP-MS ,200.8, Dissolved**

Method Number : E200.8

Date Received : 10/04/1999

Date Prepared : 10/05/1999

Client Project ID :

Lab Work Order : 99-4999

Units : mg/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 99-4999-01A   | MW-2             | Groundwater   | 10/01/1999  | 10/05/1999    | 1               | 0.24 B        | 0.0014          |
| 99-4999-02A   | MW-3             | Groundwater   | 10/01/1999  | 10/05/1999    | 1               | 0.29 B        | 0.0014          |
| 99-4999-03A   | MW-4             | Groundwater   | 10/01/1999  | 10/05/1999    | 1               | 0.047 B       | 0.0014          |
| MB-5376       |                  |               |             | 10/05/1999    | 1               | 0.0023        | 0.0014          |

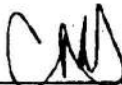
**Qualifiers:**

U - Not Detected at the Reporting Limit

E - Reported concentration above quantitation range

S - Spike recovery outside accepted recovery limits

B - Analyte detected in the associated Method Blank



Analyst



Approved

10/7/99 5:28:25 PM

TOTAL P.02

Evergreen Analytical, Inc.  
4036 Youngfield St., Wheat Ridge, CO 80033  
(303) 425-6021

**Chromium**  
ICP-MS ,200.8, Dissolved

Method Number : E200.8

Date Received : 11/11/1999

Date Prepared : 11/16/1999

Client Project ID : Glenwood Ind.

Lab Work Order : 99-5727

Units : ng/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 99-5727-01A   | MW#2             | Groundwater   | 11/09/1999  | 11/17/1999    | 1               | 0.029         | 0.0014          |
| 99-5727-02A   | MW#3             | Groundwater   | 11/09/1999  | 11/17/1999    | 1               | 0.23          | 0.0014          |
| 99-5727-03A   | MW#4             | Groundwater   | 11/09/1999  | 11/17/1999    | 1               | 0.059         | 0.0014          |
| MB-5632       |                  |               |             | 11/17/1999    | 1               | U             | 0.0014          |

**Qualifiers:**

U - Not Detected at the Reporting Limit  
E - Reported concentration above quantitation range  
S - Spike recovery outside accepted recovery limits  
B - Analyte detected in the associated Method Blank



Analyst



Approved

11/17/99 3:04:51 PM

TOTAL P.02

**Chromium**  
**ICP Metals,200.7,NPDES,Dissolved**

**Method Number** : E200.7

**Date Received** : 12/09/1999

**Date Prepared** : 12/14/1999

**Client Project ID** : 97009

**Lab Work Order** : 99-6227

**Units** : mg/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 99-6227-01A   | Well #2          | Groundwater   | 12/07/1999  | 12/15/1999    | 1               | U             | 0.01            |
| 99-6227-02A   | Well #3          | Groundwater   | 12/07/1999  | 12/15/1999    | 1               | 0.18          | 0.01            |
| 99-6227-03A   | Well #4          | Groundwater   | 12/07/1999  | 12/15/1999    | 1               | 0.01          | 0.01            |
| MB-5823       |                  |               |             | 12/15/1999    | 1               | U             | 0.011           |

**Qualifiers:**

U - Not detected at the Reporting Limit (RL)

B - Analyte detected in the associated Method Blank

  
\_\_\_\_\_  
**Analyst**

  
\_\_\_\_\_  
**Approved**

12/16/99 3:54:00 PM

**Chromium**  
**ICP-MS ,200.8, Dissolved**

Method Number : E200.8

Date Received : 01/03/2000

Date Prepared : 01/04/2000

Client Project ID : Glenwood Industrial

Lab Work Order : 00-0001

Units : mg/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 00-0001-01A   | MW-1             | Groundwater   | 12/30/1999  | 01/06/2000    | 1               | 0.0071        | 0.0014          |
| 00-0001-02A   | MW-2(a)          | Groundwater   | 12/30/1999  | 01/06/2000    | 1               | 0.009         | 0.0014          |
| 00-0001-03A   | MW-3             | Groundwater   | 12/30/1999  | 01/06/2000    | 1               | 0.019         | 0.0014          |
| 00-0001-04A   | MW-4             | Groundwater   | 12/30/1999  | 01/06/2000    | 1               | 0.014         | 0.0014          |
| 00-0001-05A   | MW-5             | Groundwater   | 12/30/1999  | 01/06/2000    | 1               | 0.021         | 0.0014          |
| 00-0001-06A   | MW-2(b)          | Groundwater   | 12/30/1999  | 01/06/2000    | 1               | 0.012         | 0.0014          |
| MB-5942       |                  |               |             | 01/06/2000    | 1               | U             | 0.0014          |

**Qualifiers:**

U - Not Detected at the Reporting Limit  
E - Reported concentration above quantitation range  
S - Spike recovery outside accepted recovery limits  
B - Analyte detected in the associated Method Blank



Analyst



Approved

1/10/2000 12:09:17 PM

Evergreen Analytical, Inc.  
4036 Youngfield St., Wheat Ridge, CO 80033  
(303) 425-6021

**Chromium**  
ICP-MS ,200.8, Dissolved

Method Number : E200.8  
Date Received : 03/27/2000  
Date Prepared : 03/29/2000

Client Project ID : GLENWOOD IND.  
Lab Work Order : 00-1449  
Units : mg/L

| Lab Sample ID | Client Sample ID | Sample Matrix | Sample Date | Analysis Date | Dilution Factor | Sample Result | Reporting Limit |
|---------------|------------------|---------------|-------------|---------------|-----------------|---------------|-----------------|
| 00-1449-01A   | MW-2             | Groundwater   | 03/23/2000  | 03/29/2000    | 1               | 0.02          | 0.00077         |
| 00-1449-02A   | MW-3             | Groundwater   | 03/23/2000  | 03/29/2000    | 1               | 0.011         | 0.00077         |
| 00-1449-03A   | MW-4             | Groundwater   | 03/23/2000  | 03/29/2000    | 1               | 0.012         | 0.00077         |
| MB-6481       |                  | .             |             | 03/29/2000    | 1               | U             | 0.00077         |

**Qualifiers:**

U - Not Detected at the Reporting Limit  
E - Reported concentration above quantitation range  
S - Spike recovery outside accepted recovery limits  
B - Analyte detected in the associated Method Blank

  
Analyst

  
Approved

**EVERGREEN ANALYTICAL, Inc.**  
4036 Youngfield St. Wheat Ridge, CO 80033  
(303) 425-6021

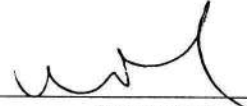
**Analysis Report**

Date Sampled : 03/23/00  
Date Received : 03/27/00  
Date Prepared : 03/28/00  
Date Analyzed : 03/28/00

Client Project I.D. : Glenwood Ind.  
Lab Project Number : 00-1449  
Matrix : Water  
Method : EPA 150.1

| Evergreen<br>Sample # | Client<br>Sample I.D. | pH   |
|-----------------------|-----------------------|------|
| 00-1449-01            | MW-2                  | 7.33 |
| 00-1449-02            | MW-3                  | 7.21 |
| 00-1449-03            | MW-4                  | 7.23 |

  
\_\_\_\_\_  
Analyst

  
\_\_\_\_\_  
Approved



# STATE OF COLORADO

Bill Owens, Governor  
Jane E. Norton, Executive Director

*Dedicated to protecting and improving the health and environment of the people of Colorado*

## HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

<http://www.cdphe.state.co.us/hm/>

4300 Cherry Creek Dr. S.  
Denver, Colorado 80246-1530  
Phone (303) 692-3300  
Fax (303) 759-5355

222 S. 6th Street, Room 232  
Grand Junction, Colorado 81501-2768  
Phone (970) 248-7164  
Fax (970) 248-7198



Colorado Department  
of Public Health  
and Environment

May 1, 2000

Theodore O. Meiggs Ph.D.  
FOREMOST Solutions, Inc.  
350 Indiana Street, Suite 415  
Golden, Colorado 80401

RE: Cleanup of Chromium Contamination  
EIMCO / Glenwood Industrial, LLC Site  
2222 Deveruex Road, Glenwood Springs  
COD981544786

Dear Mr. Meiggs:

I have received your April 17, 2000 semiannual groundwater report in which sampling data are presented and the progress of the cleanup effort is described. My review of your report suggests that the combined chemical and biochemical treatment system has converted the highly water soluble hexavalent chromium to insoluble trivalent chromium, thereby stabilizing the contamination and preventing continued leaching to ground water at the Glenwood Springs facility. Test results confirm that ground water quality has improved with the reduction of chromium concentrations to below the State standard for this contaminant in all wells.

Based on the information provided in the April 17<sup>th</sup> report, the treatment of both the source area and ground water appears to have been successful. Unless new data is generated proving otherwise, the Department does not intend to have the owners or tenants of the 2222 Deveruex Road facility pursue this matter any further. No further corrective action is required with regard to this past release. We also concur with your proposal to close the five ground water monitoring wells in accordance with procedures established by the State Engineers Office (Department of Natural Resources, Division of Water Resources). I thank you and your client, Glenwood Industrial, for having chosen to pursue this matter to its successful conclusion.

Please feel free to call me at (303) 692-3362 if you have any questions regarding this letter.

Sincerely,

Walter Avramenko, Unit Leader  
Hazardous Waste Corrective Action Unit  
Compliance Program

cc: Gary Schultz - Glenwood Industrial, LLC  
Valois Shea - USEPA Region VIII / UIC Program  
Kathleen Wahlberg - CDPHE / HMWMD

# STATE OF COLORADO

Bill Owens, Governor  
Jane E. Norton, Executive Director

*Dedicated to protecting and improving the health and environment of the people of Colorado*

**HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION**  
<http://www.cdphe.state.co.us/hm/>

4300 Cherry Creek Dr. S.  
Denver, Colorado 80246-1530  
Phone (303) 692-3300  
Fax (303) 759-5355

222 S. 6th Street, Room 232  
Grand Junction, Colorado 81501-2768  
Phone (970) 248-7164  
Fax (970) 248-7198



**Colorado Department  
of Public Health  
and Environment**

April 25, 2000

Mr. Gary Schultz  
Glenwood Industrial, LLC  
P.O. Box 1150  
Glenwood Springs, CO 81602-1150

Dear Mr. Schultz:

RE: Glenwood Industrial, LLC  
Receipt of Completion Report  
EPA ID#COD981544786  
Project # 002GENV06ALL01

The Hazardous Materials and Waste Management Division of the Colorado Department of Public Health and Environment (the Department) acknowledges receipt of a document titled, "Results of Semiannual Groundwater Monitoring", dated April 21, 2000. This document was received in our office on April 24, 2000.

It has been determined that this document is a "Completion Report" pursuant to 6CCR 1007-3 §100.26. Therefore, it is estimated that the Department review will be completed within 30 days and will take no more than 40 hours. The proposed review completion date is May 18, 2000. Please refer any comments or questions to Walter Avramenko at (303)692-3362.

Sincerely,

Kathleen D. Wahlberg  
Program Analyst

cc: Walter Avramenko, HMWMD

# STATE OF COLORADO

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**Colorado Department  
of Public Health  
and Environment**

April 21, 2000

Theodore O. Meiggs Ph.D.  
FOREMOST Solutions, Inc.  
350 Indiana Street, Suite 415  
Golden, Colorado 80401

RE: Voluntary Cleanup of Chromium Contamination  
EIMCO / Glenwood Industrial, LLC. Site  
2222 Deveruex Road, Glenwood Springs  
COD981544786

Dear Mr. Meiggs:

I have received your April 17, 2000 semiannual groundwater report in which sampling data are presented and the progress of the cleanup effort is discussed. A quick review of your report suggests that the recirculating anaerobic bioremediation system has converted the highly water soluble hexavalent chromium to insoluble trivalent chromium, thereby stabilizing the contamination and preventing continued leaching to groundwater at the Glenwood Springs facility.

On July 1, 1999 a new regulation went into effect to deal with cleanups similar to what was undertaken at Camelot Cleaners. A copy of this new regulation, 6 CCR 1007-3, Section 100.26, is included with this letter for your review. Considering our long involvement at the site and the all the documents currently contained within our files, I see no need for preparing a formal application to close this site under this new streamlined process. Before proceeding with a thorough review of the April 17, 2000 report, I ask that either you or your client prepare a short letter requesting that the Department review the report and approve its recommendation (no further action) under this corrective action plan rule. This letter should acknowledge that your client is requesting that the site be handled under the new rule and that the previously submitted documents be considered the required "application". The only other additional information requested is noted in 100.21(c)(1) and (2) of this rule. Without such a request and the deadlines the new rule imposes upon the review process, Unit staff who are reviewing other documents prepared under compliance orders, permits and this new rule may not be able to review your report in a timely manner.

Page Two  
EIMCO / Glenwood Industrial, LLC. Site  
April 21, 2000

Please feel free to call me at (303) 692-3362 if you have any questions regarding this letter or the new corrective action plan rule.

Sincerely,

A handwritten signature in black ink, appearing to read 'W. Avramenko', with a long horizontal flourish extending to the right.

Walter Avramenko, Unit Leader  
Hazardous Waste Cleanup Unit  
Compliance Program

(2) Permits issued under this section shall provide for construction of such facilities as necessary, and for operation of the facility for not longer than one year. Any permit may be renewed not more than three times. Each such renewal shall be for a period of not more than one year.

(d) The Department may order an immediate termination of all operations at the facility at any time it determines that termination is necessary to protect human health and the environment.

**§ 100.26 Corrective Action Plan.**

(a) The owner or operator of a hazardous waste facility that is subject to the corrective action or closure requirements of Part 264 or Part 265, but that does not currently have a treatment, storage or disposal permit, may submit an application for a Corrective Action Plan to conduct corrective action or closure. Applications for such permits may be for entire facilities or portions thereof.

(b) The Department shall review applications submitted under this section and shall provide formal written notification that a corrective action plan submitted to the Department under this section has been approved or disapproved. In the event the corrective action plan is not approved by the Department, the Department shall promptly provide the applicant with a written statement of the reasons for such denial. If the Department disapproves a corrective action plan based upon the applicant's failure to submit the information required by subsection (c), the Department shall notify the applicant of the specific information omitted by the applicant. The Department shall use its best efforts to:

(1) Complete the review of the initial application within sixty (60) days after submittal and spend no more than forty (40) hours to review simple corrective action plans and no more than one hundred (100) hours to review more complex corrective action plans;

(2) Complete the review of each separate report/plan submitted under a phased approach corrective action plan within sixty (60) days after submittal of such report/plan and spend no more than forty (40) hours to review such report/plan; and

(3) Complete the review of the completion report for an approved corrective action plan within thirty (30) days after submittal of such completion report and spend no more than twenty (20) hours to review such completion report.

(c) Applications for Corrective Action Plans under this section shall include, at a minimum, the following:

- (1) name(s) and address(es) of the owner and operator of the facility;
- (2) name and telephone number of the facility contact person for the application;
- (3) location of the facility;
- (4) EPA Identification Number of the facility;

- (5) description of historic uses and waste handling practices at the facility;
- (6) description of site characterization activities and type and extent of contamination identified to date, including a description of any hazardous waste or hazardous constituents; and
- (7) a Corrective Action Plan that either:

- (i) includes characterization data that describes fully the vertical and horizontal extent of contamination and either:

- (A) a remediation plan or

- (B) a request for no further action

- that is based on meeting state standards or risk-based cleanup goals; or

- (ii) provides for a phased approach to investigation of the full vertical and horizontal extent of contamination and cleanup of hazardous wastes and constituents, as necessary, based on state standards or risk-based cleanup goals.

(d) Corrective Action Plans approved under this section:

- (1) shall specify the date they become effective; .

- (2) shall specify actions the applicant must take to comply with the closure or corrective action requirements of Part 264 or 265, as appropriate, and a schedule for implementing such actions; and

- (3) may designate corrective action management units or temporary units under §§ 264.552 or 264.553, in accordance with § 100.21(e);

(e) Corrective Action Plans approved under this section are subject to the provisions of § 100.32.

(f) Corrective Action Plans approved under this section do not authorize any action that requires a permit under this Part for the treatment, storage, or disposal of hazardous waste.

(g) Corrective Action Plans approved under this section, and any determinations that the Department makes pursuant thereto, are requirements of Part 3 of the Act, and are subject to appeal pursuant to the provisions of § 25-15-305, C.R.S.

(h) Corrective Action Plans approved under this section do not excuse, nor constitute a defense to, any prior violation of the Act or the Regulations. Approval of a Corrective Action Plan under this section does not impair the Department's ability to take any other appropriate action (including issuing or modifying permits or orders) regarding releases of hazardous wastes or hazardous constituents that are not addressed in the Corrective Action Plan.



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**Colorado Department  
of Public Health  
and Environment**

May 20, 1999

Theodore O. Meiggs Ph.D.  
FOREMOST Solutions, Inc.  
350 Indiana Street, Suite 415  
Golden, Colorado 80401

RE: Voluntary Cleanup of Chromium Contamination  
EIMCO / Glenwood Industrial, LLC. Site  
2222 Deveruex Road, Glenwood Springs  
COD981544786

Dear Mr. Meiggs:

I have reviewed your May 6, 1999 letter workplan which proposes to construct and operate a system to remediate chromium contaminated groundwater at the former EIMCO facility in Glenwood Springs, Colorado. Your plan proposes to use a recirculating anaerobic bioremediation system that will reduce the highly water soluble hexavalent chromium to insoluble trivalent chromium. My only comments to the plan are discussed in the paragraphs that follow.

1. You propose to continue sampling groundwater from monitoring wells on-site semi-annually. Considering that hexavalent chromium is water soluble and that fluids will be circulating through the suspected source area, it is possible that the start-up of the treatment system will initially mobilize some of the hexavalent chromium in the soil and carry it into the underlying aquifer. If this occurs, chromium concentrations in downgradient well MW-3 could conceivably increase until the necessary anaerobic conditions have been established after which concentrations should decline. I therefore recommend that groundwater samples be collected from MW-3 at least quarterly following system start-up, if not more frequently, to ensure that high levels of contamination are not released into the Colorado River alluvium where groundwater is expected to move quickly. More frequent monitoring of this sampling point should continue until groundwater travel times indicate that sufficient time has elapsed to have observed an effect at MW-3 and no major increases in chromium concentrations are observed in this well after fluids injected into the treatment/infiltration trench have had an opportunity to reach this well. Afterwards, MW-3 may be included in the semi-annual sampling program with the other wells.

May 20, 1999

EIMCO / Glenwood Industrial, LLC. Site

May 20, 1999

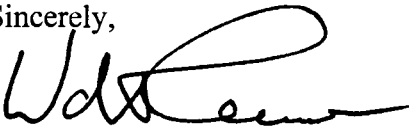
2. Data collected during the implementation of the workplan should be summarized in a report sent to me semi-annually, shortly after the collection of the semi-annual groundwater monitoring data. This report should evaluate the success of the treatment system to remediate both the source area and the groundwater.

3. A report summarizing all data collected at the site and the system's success at achieving the groundwater standard should be included with your no further action request.

Assuming that the comments noted above are incorporated into your proposal, I hereby approve the May 6, 1999 workplan and recommend that it be implemented as soon as is technically feasible.

Please feel free to call me at (303) 692-3362 if you have any questions regarding this letter or your proposed corrective action program, or simply wish to update me on the progress of cleanup activities.

Sincerely,

A handwritten signature in black ink, appearing to read 'Walter Avramenko', with a stylized, flowing script.

Walter Avramenko, Unit Leader  
Hazardous Waste Cleanup Unit  
Compliance Program

cc: Sheila Gaston - CDPHE

# HMWMD Corrective Action Review Tracking Form

Facility Name: EIMCO

EPA ID No.: COD981544786

NOTICE OF INSPECTION - ☒ Yes ☐ No

Submitted By: Avramenko

NOI Review Date: 5-20-99

Enforcement Followup Review: ☐ Yes

If Non-Notifier, Complete Location Address: Street: \_\_\_\_\_

City: \_\_\_\_\_ County: \_\_\_\_\_ Zip: \_\_\_\_\_

Coverage Area(s) Evaluated with Violation Determination (Enter Y, N, or U): ☐ GOR-Other Generator ☐ DOR-Other TSD

☐ CAS-CA Schedule Other Area Codes with Determination: \_\_\_\_\_

Notification(s): ☒ LOG, ☐ SQG, ☐ Exempt, ☐ LDF, ☐ TSF, ☐ Transporter, ☐ Non-Notifier, or ☐ Other

NOI Comments: Reviewed FSI's May 6, 1999 work plan for GW treatment. Responded with an approval letter.

## CORRECTIVE ACTION EVENT TRACKING -

Instrument Type: Voluntary

New Instrument? ☐ Yes ☒ No If yes and Project Number is needed, complete CA Project Initiation Form.

☐ GW ☐ Soil ☐ Air ☐ SW

### CORRECTIVE ACTION EVENT INFORMATION

| Provide Area Name or Area Type (SWMU/OU/AOC/RUR) and Number                                           | Event Code    | Status Code | Scheduled Date | Actual Date    |
|-------------------------------------------------------------------------------------------------------|---------------|-------------|----------------|----------------|
| If new area, enter name, CA006, and identify media contaminated (GW, Air, Soil, and/or Surface Water) |               |             |                |                |
| Area Name(s): <u>Site: Groundwater</u>                                                                | CA <u>300</u> |             | <u>1/1</u>     | <u>5/20/99</u> |
| Event Comments: <u>"</u>                                                                              |               |             |                |                |
| Area Name(s): <u>"</u>                                                                                | CA <u>400</u> |             | <u>1/1</u>     | <u>5/20/99</u> |
| Event Comments: <u>"</u>                                                                              | <u>450</u>    |             |                | <u>5-20-99</u> |
| Area Name(s): <u>"</u>                                                                                | CA <u>500</u> |             | <u>1/1</u>     | <u>5/20/99</u> |
| Event Comments: _____                                                                                 |               |             |                |                |

If the event is also a Permitting/Closure event, complete SPAR Form. If an enforcement action, update the Case Development System.

### FILING INFORMATION

Vol. No. \_\_\_\_\_

File in ☐ M&E Files or ☐ Facilities Files Complete the following if Facilities File

Facility Code: \_\_\_\_\_ Submitted By: CDPHE Facility Document Date: \_\_\_\_\_

Content: ☐ Other ☐ Correspondence ☐ Tech Material ☐ Response to Comments

Catagory: ☐ 1. Correspondence ☐ 2. Confidential Information ☐ 8. Corrective Action ☐ 11. Miscellaneous

Keywords: \_\_\_\_\_

Enter NOI Comments into Filing Database: ☐ Yes ☐ No

### CRIS ROUTING INFORMATION

INITIALS

INITIALS

Inspector: Complete NOI Section and Submit to Tracking ASAP

\_\_\_\_\_

Administrative Assistant:

\_\_\_\_\_

Mail Original Letter, and Copies as Listed

Inspector: Draft Offline Documentation. In CRIS select Determination and Documentation Type. Send "Review" Action Item.

\_\_\_\_\_

Copy to Lead Inspector ☐ YES ☐ NO

Unit Leader: Review Document. In CRIS review Doc. Type & Deter.

\_\_\_\_\_

White copy of this Form To Tracking

Review Send "Edit / Miscellaneous / Determination" Action Item(s).

\_\_\_\_\_

Copy of Letter with yellow copy of this Form to File In CRIS, Delete Action Item only after Documents Received.

Inspector: Revise Offline Documentation.

\_\_\_\_\_

Tracking:

Revise In CRIS, Send "Review" Action Item.

\_\_\_\_\_

Track NOI Section in CRIS.

Unit Leader: Sign Documentation. Submit Documents to Admin. Asst.

\_\_\_\_\_

Track CAR Event(s) in RCRIS.

Approve In CRIS, Send "Finalize" Action Item

\_\_\_\_\_

Remember: The Actual Date is the date of the correspondence which may be different than the NOI Review Date. This Form replaces the NOI Form, Routing Form and CA Tracking Form for Corrective Action Reviews Only.



# **Instrument Type and Authority**

Unilateral Order (U-C)  
Consent Decree (C-D)  
Judicial Decree (D-U)

Operating Permit (O-A)  
Judicial Order (J-U)  
Other (Z- ) (Specify Instrument Type)

Consent Order (A-D)    Post-Closure Permit (P-A)  
Permit Mod (M-A)      Order Modification (N-D)  
Voluntary Corrective Action (V-U)

## **RCRIS EVENT AND STATUS CODES**

| Event Code | Event Description                                                                                                                          | Event Code  | Event Description                                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------|
|            | <b>Status Code &amp; Status Code Description</b>                                                                                           |             | <b>Status Code &amp; Status Code Description</b>                                                                                   |
| 006        | Type of Unit <b>AC</b> Area of Concern - <b>OU</b> Operable Unit<br>- <b>RU</b> Regulated Unit Release - <b>SM</b> SWMU                    | 460         | Cost Est. for Remedy Received                                                                                                      |
| 010        | RFA Initiation                                                                                                                             | 470         | Financial Assur for Remedy Demo                                                                                                    |
| <b>050</b> | RFA Complete<br><b>RF</b> assessment was an RFA -<br><b>PA</b> assessment was a PA-Plus<br><b>IK</b> assessment by institutional knowledge | 496         | Completed CMI Workplan<br><b>30%, 60%, or 90% Completed</b>                                                                        |
| 060        | Notice of Contamination                                                                                                                    | 497         | Completed IM Implementation Workplan<br><b>30%, 60%, or 90% Completed</b>                                                          |
| 070**      | RFI Determination<br><b>YE</b> RFI necessary - <b>NO</b> **RFI not necessary                                                               | 500         | CM Implementation WP Approved                                                                                                      |
| 075        | CA Prioritization<br><b>HI</b> high - <b>ME</b> medium - <b>LO</b> low priority                                                            | 506         | CM Implemented                                                                                                                     |
| 100        | RFI Imposition<br><b>DC</b> focused data collection for stabilization evaluation                                                           | 510         | Deter of Technically Impracticability                                                                                              |
| 110        | RFI Workplan Received                                                                                                                      | 550**       | Cert. of Remedy Completion (CMI)                                                                                                   |
| 120        | RFI WP Mod Requested                                                                                                                       | <b>600*</b> | Stabilization Measures Implemented                                                                                                 |
| 140        | RFI WP NOD (Enter NOD # in Event Comments)                                                                                                 |             | <u>Mark All That Apply</u>                                                                                                         |
| 150        | RFI Workplan Approved                                                                                                                      |             | <b>SR</b> primary measure is source removal/treatment                                                                              |
| 155        | RFI Supp Info Requested                                                                                                                    |             | <b>EC</b> primary measure is exposure control by barrier<br>and/or institutional control (capping, fencing...)                     |
| 160        | RFI Supp Info Received                                                                                                                     |             | <b>GW</b> groundwater extraction and treatment                                                                                     |
| 170        | RFI Supp Info Satisfactory                                                                                                                 |             | <b>OT</b> other (Enter Event Comments)                                                                                             |
| 180        | RFI Implementation Begun                                                                                                                   |             | <b>*Unit Specific Event Comments for CA600 Required</b>                                                                            |
| 190        | RFI Report Recieved                                                                                                                        | 650**       | Stabilization Measures Constructed or Completed                                                                                    |
| 195        | RFI Progress Reports Received                                                                                                              |             | <b>CC</b> construction completed                                                                                                   |
| 200        | RFI Report Approved                                                                                                                        |             | <b>SC</b> stabilization completed                                                                                                  |
| 210**      | CA Responsibility Referred<br><b>SF</b> referred to CERCLA -<br><b>OT</b> referred to other non-RCRA Federal Authority                     | 725         | Current Human Exposure Under Control                                                                                               |
| 225        | Stabilization Measures Evaluated<br><b>YE</b> amenable - <b>IN</b> more investigation -<br><b>NR</b> not required - <b>NF</b> not feasible |             | <b>YE</b> yes, controlled -<br><b>NC</b> no control measures necessary -<br><b>NO</b> not controlled - <b>IN</b> insufficient data |
| 250        | CMS Imposed                                                                                                                                | 750         | Migration of Contaminated GW Under Control                                                                                         |
| 260        | CMS Workplan Received                                                                                                                      |             | <b>YE</b> yes, controlled -<br><b>NR</b> no release to GW -<br><b>NO</b> not controlled - <b>IN</b> insufficient data              |
| 270        | CMS Workplan Mod Requested                                                                                                                 | 999         | CA Process Terminated                                                                                                              |
| 300        | CMS Workplan Approved                                                                                                                      |             | <b>NF</b> no further action - <b>RM</b> remediation completed                                                                      |
| 305        | CMS Supp Info Requested                                                                                                                    | <b>**</b>   | <b>ENTER CA999 EVENT IF PROCESS TERMINATED</b>                                                                                     |
| 310        | CMS Supp Info Received                                                                                                                     |             | <u>For the following Other Event Codes enter one of<br/>the following Status Codes:</u>                                            |
| 320        | CMS Supp Info Adequate                                                                                                                     |             | <b>AS</b> additional study - <b>IM</b> interim measure                                                                             |
| 330        | CMS Implementation Begun                                                                                                                   |             | <b>TS</b> treatability study - <b>DI</b> design investigation -<br><b>OM</b> operation and maintenance                             |
| 340        | CMS Report Received                                                                                                                        | 801         | Other Imposed                                                                                                                      |
| 345        | CMS Progress Reports Received                                                                                                              | 811         | Other Workplan Received                                                                                                            |
| 350        | CMS Approved (Complete)                                                                                                                    | 812         | Other Workplan Modification Requested                                                                                              |
| 370        | Petition for No Further Action                                                                                                             | 814         | Other Workplan Approved                                                                                                            |
| 375**      | Decision on Petition for NFA                                                                                                               | 816         | Other Supplemental Information Requested                                                                                           |
| 380        | Public Notice on Proposed Remedy                                                                                                           | 817         | Other Supplemental Information Received                                                                                            |
| 400        | Remedy Selection (CM Imposed)                                                                                                              | 818         | Other Supplemental Information Adequate                                                                                            |
| 410        | Submitted Remedy Design                                                                                                                    | 821         | Other Implementation Begun                                                                                                         |
| 446        | Completed CMD Approval<br><b>30%, 60%, or 90% Completed</b>                                                                                | 831         | Other Report Received                                                                                                              |
| 447        | Completed Interim Measures Design Approval<br><b>30%, 60%, or 90% Completed</b>                                                            | 832         | Other Progress Report Received                                                                                                     |
| 450        | CM Design Approved                                                                                                                         | 834         | Other Report Approved                                                                                                              |
|            |                                                                                                                                            | 841         | Other Approval                                                                                                                     |
|            |                                                                                                                                            |             | Other (See Tracking, Enter Event Comments)                                                                                         |

If event code is bolded, then event will go to EPA's National Database.



# STATE OF COLORADO

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Colorado Department  
of Public Health  
and Environment

Howard Roitman, Division Director  
Hazardous Materials and Waste Management Division

Fax Transmission Sheet  
Fax #: (303) 759-5355

IMMEDIATE DELIVERY TO: Theodore Meiggs

COMPANY/AGENCY: FSI

TELEPHONE#: \_\_\_\_\_

TELEFAX#: 303-278-0624

FROM: Walter Avramenko

**FAXED**  
13:57/5-20

TELEPHONE: 303-692-3362

SUBJECT: Elmco Plan Approval

DATE: May 20, 1999

NUMBER OF PAGES TO FOLLOW: 2

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
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Howard Roitman, Division Director  
Hazardous Materials and Waste Management Division

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Fax #: (303) 759-5355

IMMEDIATE DELIVERY TO : \_\_\_\_\_

COMPANY/AGENCY: \_\_\_\_\_

TELEPHONE#: \_\_\_\_\_

TELEFAX#: \_\_\_\_\_

FROM: \_\_\_\_\_

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Colorado Department  
of Public Health  
and Environment

May 20, 1999

Theodore O. Meiggs Ph.D.  
FOREMOST Solutions, Inc.  
350 Indiana Street, Suite 415  
Golden, Colorado 80401

RE: Voluntary Cleanup of Chromium Contamination  
EIMCO / Glenwood Industrial, LLC. Site  
2222 Deveruex Road, Glenwood Springs  
**COD981544786**

Dear Mr. Meiggs:

I have reviewed your May 6, 1999 letter workplan which proposes to construct and operate a system to remediate chromium contaminated groundwater at the former EIMCO facility in Glenwood Springs, Colorado. Your plan proposes to use a recirculating anaerobic bioremediation system that will reduce the highly water soluble hexavalent chromium to insoluble trivalent chromium. My only comments to the plan are discussed in the paragraphs that follow.

1. You propose to continue sampling groundwater from monitoring wells on-site semi-annually. Considering that hexavalent chromium is water soluble and that fluids will be circulating through the suspected source area, it is possible that the start-up of the treatment system will initially mobilize some of the hexavalent chromium in the soil and carry it into the underlying aquifer. If this occurs, chromium concentrations in downgradient well MW-3 could conceivably increase until the necessary anaerobic conditions have been established after which concentrations should decline. I therefore recommend that groundwater samples be collected from MW-3 at least quarterly following system start-up, if not more frequently, to ensure that high levels of contamination are not released into the Colorado River alluvium where groundwater is expected to move quickly. More frequent monitoring of this sampling point should continue until groundwater travel times indicate that sufficient time has elapsed to have observed an effect at MW-3 and no major increases in chromium concentrations are observed in this well after fluids injected into the treatment/infiltration trench have had an opportunity to reach this well. Afterwards, MW-3 may be included in the semi-annual sampling program with the other wells.

May 20, 1999

EIMCO / Glenwood Industrial, LLC. Site

May 20, 1999

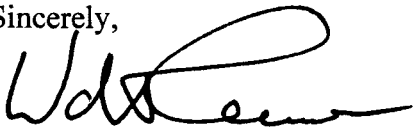
2. Data collected during the implementation of the workplan should be summarized in a report sent to me semi-annually, shortly after the collection of the semi-annual groundwater monitoring data. This report should evaluate the success of the treatment system to remediate both the source area and the groundwater.

3. A report summarizing all data collected at the site and the system's success at achieving the groundwater standard should be included with your no further action request.

Assuming that the comments noted above are incorporated into your proposal, I hereby approve the May 6, 1999 workplan and recommend that it be implemented as soon as is technically feasible.

Please feel free to call me at (303) 692-3362 if you have any questions regarding this letter or your proposed corrective action program, or simply wish to update me on the progress of cleanup activities.

Sincerely,

A handwritten signature in black ink, appearing to read 'Walter Avramenko', with a stylized, flowing script.

Walter Avramenko, Unit Leader  
Hazardous Waste Cleanup Unit  
Compliance Program

cc: Sheila Gaston - CDPHE

# STATE OF COLORADO

Roy Romer, Governor  
Patti Shwayder, Executive Director

*Dedicated to protecting and improving the health and environment of the people of Colorado*

## HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

4300 Cherry Creek Dr. S.  
Denver, Colorado 80222-1530  
Phone (303) 692-3300  
Fax (303) 759-5355

222 S. 6th Street, Room 232  
Grand Junction, Colorado 81501-2768  
Phone (303) 248-7164  
Fax (303) 248-7198



Colorado Department  
of Public Health  
and Environment

July 12, 1996

Mr. Hal J. Pos  
Parsons Behle & Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Status of Groundwater Sampling and Installation of an Additional Monitoring Well  
Eimco Coal Machinery, Inc.  
2222 Devereux Road, Glenwood Springs, CO  
EPA ID# COD 98 154 4786

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division (the Division), has reviewed the June 21, 1996 document titled "Status of Groundwater Sampling and Installation of an Additional Monitoring Well" submitted by Envirosearch International in Eimco's behalf. This document is a response to the June 3, 1996 letter from the Division.

Based upon the documented trends of the ground water flow beneath this facility, it does not appear that the proposed monitor well location for MW-5 would be down-gradient of MW-3. MW-3 has consistently shown the highest levels of chromium concentrations in the ground water. In order to determine if the ground water contamination is leaving the site, MW-5 should be installed down-gradient of and to the north/northwest of MW-3. Possibly, about 50 feet east of the proposed location, just outside the approximate leach field boundary. The exact location of the monitor well may be determined in the field based upon the site logistics.

The Division also recommends that a water sample be collected for analysis from the new monitor well, MW-5, after installation and development in addition to being included in the semi-annual ground water sampling to be conducted in December. This additional information may hasten the Division's determination concerning the possibility of an off-site ground water impact. The sample analysis should follow the same guidelines as the previously approved quarterly ground water sampling plan.

Eimco Coal Machinery, Inc. should prepare and submit a response to the comments above within 15 days of receipt of this letter.

Mr. Pos  
July 12, 1996  
Page 2

If you have any questions of a technical nature please contact Sheila Gaston, of the Division, at (303) 692-3332. Questions of a legal nature should be directed to Daniel Miller, of the Office of the Attorney General, at (303) 866-5129.

Sincerely,

A handwritten signature in black ink, appearing to read "Walter Avramenko". The signature is fluid and cursive, with a long horizontal stroke at the end.

Walter Avramenko, Unit Leader  
Hazardous Waste Cleanup and Permitting Unit  
Compliance Program

cc: Joe Cettin, Eimco Coal Machinery  
Daniel Miller, AGO  
Mark Bean, Garfield County Regulatory Office  
Corbin Darling, EPA  
Craig Scola, Envirosearch International

# STATE OF COLORADO

Roy Romer, Governor  
Patti Shwayder, Acting Executive Director

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Colorado Department  
of Public Health  
and Environment

June 3, 1996

Mr. Hal J. Pos  
Parsons Behle & Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Status Report of Groundwater Sampling  
Eimco Coal Machinery, Inc.  
2222 Devereux Road, Glenwood Springs, CO  
EPA ID# COD 98 154 4786

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division (the Division), has reviewed the May 13, 1996 document entitled "Status Report of Groundwater Sampling" submitted by Envirosearch International in Eimco's behalf. This document includes data from the March 14, 1996 sampling of the existing four monitor wells at the site.

As discussed with Craig Scola of Envirosearch on May 22, 1996, the Division agrees that sufficient ground water sampling data has been obtained to reduce the sampling frequency to semi annually. Based upon the results of the sampling completed to date, the most beneficial months to collect future ground water samples would be June and December. The sampling should continue to be conducted as approved under the quarterly ground water sampling plan and should continue to include the measurement of ground water elevations at the time of sampling.

The quarterly ground water sampling data has continued to show seasonally high concentrations of dissolved chromium in the most downgradient well, MW-3. Due to the fact that the levels of ground water contamination have not been reduced by the remediation of the sump area, the Division recommends that an additional monitor well should be installed down gradient of MW-3 in order to evaluate the impact of or potential for impact on off-site ground water. The monitor well should be installed as far downgradient from the site as is physically possible. The purpose of this well would be to determine if the chromium contamination in excess of the allowable state standard has continued off-site in the direction of the river, or if it is contained on-site.

The off-site monitor well should also be included in the semi-annual ground water sampling events completed following its installation.

Mr. Pos  
May 31, 1996  
Page 2

Eimco Coal Machinery, Inc. should prepare and submit a response to the comments above within 15 days of receipt of this letter.

If you have any questions of a technical nature please contact Sheila Gaston, of the Division, at (303) 692-3332. Questions of a legal nature should be directed to Daniel Miller, of the Office of the Attorney General, at (303) 866-5129.

Sincerely,

A handwritten signature in black ink, appearing to read "Walter Avramenko", with a long horizontal flourish extending to the right.

Walter Avramenko, Unit Leader  
Hazardous Waste Cleanup and Permitting Unit  
Compliance Program

cc: John Habets, Eimco Coal Machinery  
Daniel Miller, AGO  
Mark Bean, Garfield County Regulatory Office  
Corbin Darling, EPA



# STATE OF COLORADO

## COLORADO DEPARTMENT OF HEALTH

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Laboratory Building  
4210 E. 11th Avenue  
Denver, Colorado 80220-3716  
(303) 691-4700



Roy Romer  
Governor

Patricia A. Nolan, MD, MPH  
Executive Director

April 26, 1994

Mr. Hal J. Pos  
Parsons Behle & Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Report of Former Chromium Plating Pit Excavation Activities and Subsequent Groundwater Monitoring  
Eimco Coal Machinery, Inc.  
EPA ID# COD 98 154 4786

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division of the Colorado Department of Health (the Division), has reviewed the March 29, 1994 report entitled "Report of Former Chromium Plating Pit Excavation Activities and Subsequent Groundwater Monitoring" submitted by Envirosearch International in Eimco's behalf. This report includes data from the former chromium plating pit excavation and the resampling of the four on-site monitor wells. The Division has the following comments on the investigation report:

1. All five confirmation soil samples collected following the pit excavation showed levels of total chromium below 100 ppm. The Division is of the opinion that the contaminated soil with the potential of being a threat to local groundwater has been remediated. Unless we receive evidence to the contrary, no further action is required by the Division with regard to the soil around this former pit.
2. Following discussions with Eric Silco of Envirosearch, it has been determined that the latest groundwater samples were analyzed for total metals instead of dissolved metals. Therefor, these results do not really reflect the current contaminant levels with respect to the state regulatory standard of 50 ppb for dissolved chromium. Based on this information, Mr. Silco has proposed to complete the next quarterly sampling event in mid-May in order to continue to monitor the groundwater quality at this facility. The Division concurs with this decision and will continue to evaluate the results of this groundwater monitoring program in order to determine if further remediation activities will be required. A report of the field procedures and laboratory results should be submitted to the Division within 30 days of the sampling event.

All sample generation and handling protocols should be followed as outlined in the original Site Assessment Quality Assurance Project Plan.

Mr. Pos  
April 26, 1994  
2

If you have any questions of a technical nature please contact Sheila Gaston, of the Division, at (303) 692-3332. Questions of a legal nature should be directed to Daniel Miller, of the Office of the Attorney General, at (303) 866-5129.

Sincerely,

A handwritten signature in black ink, appearing to read "Walt Avramenko". The signature is fluid and cursive, with a long horizontal stroke at the end.

Walter Avramenko, Unit Leader  
Corrective Action Unit  
Monitoring and Enforcement Section  
Hazardous Waste Control Program

cc: John Habets, Eimco Coal Machinery  
Daniel Miller, AGO  
Mark Bean, Garfield County Regulatory Office

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Patti Shwayder, Acting Executive Director

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## HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

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Colorado Department  
of Public Health  
and Environment

February 14, 1996

Mr. Hal J. Pos  
Parsons Behle & Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Status Report of Groundwater Sampling  
Eimco Coal Machinery, Inc., 2222 Devereux Road, Glenwood Springs  
EPA ID# COD 98 154 4786

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division (the Division), has reviewed the January 30, 1996 report entitled "Status Report of Groundwater Sampling" submitted by Envirosearch International on Eimco's behalf. This report includes data from the resampling of the existing four monitor wells at the site.

The Division has the following comments on the sampling report:

- The chain-of-custody form for the sampling event was not included in the report. Please submit a copy of the form with all of the appropriate signatures.
- Map 2 of the report shows the ground-water flow direction and ground-water elevations for this sampling event. The report does not include the actual depth to ground-water measurements and casing elevations for each well from which the ground-water elevations were calculated. Please submit a table containing this information for at least the past four sampling events.

Within 30 days of the receipt of this letter, please submit the above requested information. The quarterly ground-water sampling should continue as proposed in the sampling report.

Mr. Pos  
February 14, 1996  
Page 2

If you have any questions of a technical nature please contact Sheila Gaston, of the Division, at (303) 692-3332. Questions of a legal nature should be directed to Daniel Miller, of the Office of the Attorney General, at (303) 866-5129.

Sincerely,

A handwritten signature in black ink, appearing to read 'Walter Avramenko', with a long horizontal flourish extending to the right.

Walter Avramenko, Unit Leader  
Hazardous Waste Cleanup and Permitting Unit  
Compliance Program

cc: John Habets, Eimco Coal Machinery  
Craig Scola, Envirosearch International  
Daniel Miller, AGO  
Mark Bean, Garfield County Regulatory Office  
Corbin Darling, EPA



# STATE OF COLORADO

Roy Romer, Governor  
Patricia A. Nolan, MD, MPH, Executive Director

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Laboratory Building  
4210 E. 11th Avenue  
Denver, Colorado 80220-3716  
(303) 691-4700



Colorado Department  
of Public Health  
and Environment

August 25, 1994

Mr. Hal J. Pos  
Parsons Behle & Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Status Report of Groundwater Sampling  
Eimco Coal Machinery, Inc.  
2222 Devereux Road, Glenwood Springs, CO  
**EPA ID# COD 98 154 4786**

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division (the Division), has reviewed the June 23, 1994 report entitled "Status Report of Groundwater Sampling" submitted by Envirosearch International in Eimco's behalf. This report includes data from the resampling of the existing four monitor wells at the site. The Division has the following comments on the investigation report and on the proposed groundwater monitoring plan:

## INVESTIGATIVE METHODOLOGY - Ground Water Sampling

The aforementioned report stated that "a distinct mappable groundwater flow direction could not be drawn utilizing the water level measurements provided by Huntingdon Chen-Northern" from the May 11, 1994 sampling event. Please submit the actual groundwater elevations reported by Chen-Northern to the Division for review. Also, submit any quality control data generated by the laboratory which analyzed the samples collected on May 11, 1994.

A review of boring logs for this site shows that the monitor wells were completed in the water bearing zone which consists of boulders with sand and silt to at least a depth of 52 feet. Has any information been collected to indicate at what depth some type of confining layer might be reached so as to determine the thickness of this aquifer? Also, please submit a log of borehole and well construction for MW-4.

## ANALYTICAL RESULTS - Groundwater Sampling

The analytical report for the June 9, 1994 samples provided in Attachment 1 includes a report for sample ID EIMCO/MW-5. Was this a duplicate sample collected from MW-3?

## INVESTIGATION CONCLUSIONS

The Division agrees that quarterly sampling of the groundwater should continue (as stated in the June 10, 1993 letter from the Division) in order to evaluate the effectiveness of the source area remediation. The next sampling event should be completed as soon as possible and would fulfill the requirement of the next quarterly sampling. The most recent increase in chromium levels in MW-3 could be a result of the disturbance of the contaminated soils in the source area during the recent remediation. If the chromium levels in MW-3 do not begin to decrease in the upcoming sampling events, an additional monitoring well may need to be installed downgradient of MW-3 to evaluate the impact of the on-site groundwater contamination to the river.

Mr. Pos  
August 25, 1994  
2

Eimco Coal Machinery, Inc. should prepare and submit a response to the information requested above within 15 days of receipt of this letter.

If you have any questions of a technical nature please contact Sheila Gaston, of the Division, at (303) 692-3332. Questions of a legal nature should be directed to Daniel Miller, of the Office of the Attorney General, at (303) 866-5129.

Sincerely,

A handwritten signature in black ink, appearing to read 'Walter Avramenko', with a long horizontal flourish extending to the right.

Walter Avramenko, Unit Leader  
Corrective Action Unit  
Monitoring and Enforcement Section  
Hazardous Waste Control Program

cc: John Habets, Eimco Coal Machinery  
Daniel Miller, AGO  
Mark Bean, Garfield County Regulatory Office



# STATE OF COLORADO

## COLORADO DEPARTMENT OF HEALTH

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(303) 691-4700



Roy Romer  
Governor

Patricia A. Nolan, MD, MPH  
Executive Director

June 10, 1993

Mr. Hal J. Pos  
Parsons Behle and Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Addendum # One Site Assessment Report  
Eimco Coal Machinery, Inc.  
EPA ID# COD 98 154 4786

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division of the Colorado Department of Health (the Division), has reviewed the June 7, 1993 report entitled "Addendum # One Site Assessment Report" submitted by Envirosearch International in Eimco's behalf. This report includes data from the installation of a fourth monitor well at the facility and the resampling of the existing three monitor wells. The report also presents remedial recommendations for the former chromium plating pit. The Division has the following comments on the investigation report and on the proposed remediation:

1. Section 3.0 Analytical Results

The federal maximum contaminant level for chromium in drinking water of 100 ppb, referenced in this section, does not apply due to the lower state regulatory standard of 50 ppb for dissolved chromium in groundwater. The report also assumes the hexavalent chromium result in MW-3 to be 41 ppb instead of the reported laboratory result of 61 ppb. In a discussion with the laboratory, it was stated that the notation on their report that the hexavalent chromium result "is probably lower than 0.061 due to cloudiness of sample during analysis" was incorrect because in checking the analyst's records, no cloudiness for that sample was recorded. In fact, a 1:2 dilution of the sample was required for analysis due to the concentration of color developed during analysis. In any event, the dissolved chromium and hexavalent chromium results on MW-3 are very close to the regulatory limit of 50 ppb for groundwater.

2. Section 5.0 Remedial Recommendations

In addition to the proposed excavation of the concrete floor and three of the cinder

Mr. Hal J. Pos  
June 10, 1993  
Page 2

block walls, some confirmation samples will need to be taken. The Division recommends that one soil sample be taken from each of these four locations. These should not be composite samples, but point samples centrally located in each wall and the floor sample should be taken underneath the sump after removal. These samples are needed to verify the concentration levels of chromium which will remain in the soil.

Due to the increasing levels of dissolved chromium reported in MW-3, the Division will require quarterly monitoring of the groundwater at this facility for at least one year. All four monitor wells should be samples every three months. A report of the field procedures and laboratory results should be submitted to the Division within 30 days of the sampling event.

All sample generation and handling protocols should be followed as outlined in the original Site Assessment Quality Assurance Project Plan.

The Division agrees with the goals and methods contained within the remediation plan and recommends that the plan be implemented as soon as technically feasible. This approval is contingent upon the incorporation of the above comments and recommendations in the plan. Within 15 days of receipt of this letter, Eimco Coal Machinery, Inc. should prepare a letter outlining how it will modify the plan to address the Division's concerns and incorporate the recommended changes.

If you have any questions of a technical nature please contact Sheila Gaston, of the Division, at (303) 692-3332. Questions of a legal nature should be directed to Daniel Miller, of the Office of the Attorney General, at (303) 866-5129.

Sincerely,



Walter Avramenko, Unit Leader  
Corrective Action Unit  
Monitoring and Enforcement Section  
Hazardous Waste Control Program

cc: John Habets, Eimco Coal Machinery  
Daniel Miller, AGO  
Mark Bean, Garfield County Regulatory Office

# STATE OF COLORADO

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(303) 691-4700



Roy Romer  
Governor

Patricia A. Nolan, MD, MPH  
Executive Director

April 19, 1993

Mr. Hal J. Pos  
Parsons, Behl and Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Eimco Coal Machinery, Inc.

EPA ID# COD981544786

Response to March 31, 1993 proposal for Decontamination of Former Plating Pit

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division of the Colorado Department of Health (the Division), has reviewed the March 31, 1993 document entitled "Decontamination of Former Plating Pit At The Eimco Coal Machinery Facility, Glenwood Springs, Colorado" submitted by EnviroSearch in Eimco's behalf. This document discusses the proposed scope of work to decontaminate the former chrome plating pit located at the aforementioned facility. The Division agrees with the workplan proposed in this document with the following additions/revisions:

### 1. Task 1 Pit Decontamination

The final rinse water from the steam cleaning of the plating pit should be tested for total chromium to aid in the determination of "clean" for the pit. If total chromium analytical results are elevated in this rinse water, further cleaning may be necessary.

### 2. Task 2 Confirmation Sampling

The discussion of composited "solid" samples from three locations in the pit does not indicate how many subsamples will be included in each composite. This decision can highly effect the value of the resulting data. In order to identify specific locations of contamination, composite samples are not appropriate. If your are trying to determine if contamination is generally present over a large surface area, composites are appropriate as long as the number of subsamples is kept to a

April 19, 1993  
Eimco Coal Machinery, Inc.  
Page 2

minimum. Any elevated composite results, however, could mean that any one of the subsamples or all of them are contaminated. This could lead to resampling and retesting of each specific subsample location. Your sampling plan should specify the exact location of each sample to be taken and how each sample will be analyzed (separately or as part of a composite).

3. The actual decommissioning of the former chrome plating tank pit should not be performed until data from the decontamination process has been received, reviewed and approval is given by the Division.

All sample generation and handling protocols should be followed as outlined in the original Site Assessment Quality Assurance Project Plan.

We recommend that Eimco prepare and submit a response as to how these additions/revisions will be incorporated into the workplan to the Division for our review within 15 days of the receipt of this letter.

If you have any questions of a technical nature please contact Sheila Gaston, of the Division, at (303) 692-3332.

Sincerely,

A handwritten signature in dark ink, appearing to read "Walter Avramenko", with a long horizontal flourish extending to the right.

Walter Avramenko, Unit Leader  
Corrective Action Unit  
Monitoring and Enforcement Section  
Hazardous Waste Control Program

cc: John Habets, Eimco Coal Machinery



# STATE OF COLORADO

## COLORADO DEPARTMENT OF HEALTH

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Denver, Colorado 80220-3716  
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Roy Romer  
Governor

Patricia A. Nolan, MD, MPH  
Executive Director

March 2, 1993

Mr. Hal J. Pos  
Parsons, Behl and Latimer  
P.O. Box 11898  
Salt Lake City, Utah 84147-0998

RE: Eimco Coal Machinery, Inc.  
EPA ID# **COD981544786**  
Response to January 22, 1993 Addendum # One Site Assessment Quality Assurance  
Project Plan

Dear Mr. Pos:

The Hazardous Materials and Waste Management Division of the Colorado Department of Health (the Division), has reviewed the January 22, 1993 document entitled "Addendum # One Site Assessment Quality Assurance Project Plan" submitted by Envirosearch International in Eimco's behalf. This report included historical information pertaining to potential sources of contamination at the facility and proposed additional investigative activities to be performed. The Division agrees with the workplan proposed in this report as follows:

1. Section 2.1 One additional monitoring well (MW-4) to be located as identified on Map A-1 of the report. The purpose of this monitoring well is to further investigate possible ground water contamination at the site and to gather more information for ground water flow determination. The monitor well will be analyzed at a minimum for total chromium and pH.
2. Section 2.2 Ground water samples will be collected from all existing wells on site and will be analyzed at a minimum for total chromium and pH.
3. Section 2.3 A sample of the septic tank contents will be collected and analyzed for total chromium.



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# STATE OF COLORADO

## COLORADO DEPARTMENT OF HEALTH

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Roy Romer  
Governor  
Patricia A. Nolan, MD, MPH  
Executive Director

NOV 24 1992

Mr. Hal J. Pos  
Parsons, Behle and Latimer  
P.O. Box 11898  
Salt Lake City, UT 84147-0898

RE: Eimco Coal Machinery, Inc.  
EPA ID #COD981544736  
Response to October 2, 1992 Site Assessment Report

Dear Mr. Pos:

The Colorado Department of Health, Hazardous Materials and Waste Management Division (the "Department") has received the October 2, 1992 Site Assessment Report for the Eimco Coal Machinery, Inc. ("Eimco") facility in Glenwood Springs, which you submitted on Eimco's behalf. The report summarized soil and groundwater data obtained during an investigation of contamination associated with Eimco's former chrome plating pit. The Department has the following comments regarding the report:

### Pit/Sump Area:

In section 6.0 of the report, two courses of action are proposed for the site: 1) the cleaning and backfilling of the plating pit area and 2) the continued monitoring of groundwater with the newly installed wells for one year. Regarding the cleaning of the sump area, we were under the impression that all residues had already been removed from the pit/sump area. Since this is apparently not the case, we strongly recommend that all residues be removed, and the area steam cleaned as soon as possible. Of course, any residues, wash water or other wastes must be adequately characterized and disposed in compliance with the Colorado Hazardous Waste Regulations. Regarding the backfilling of the pit/sump area with gravel and lime, we do not believe this is a wise course of action since the area has not yet been adequately characterized. At this point, it is not clear from the data available that the concrete of which the pit/sump is composed does not itself exhibit a hazardous waste characteristic and/or is not still acting as source of contamination to the surrounding soil and groundwater. In addition, soil sample 2C (taken at the 6' interval) was found to contain significantly elevated levels of chromium (101 mg/kg) which appear to be increasing with depth. Also, the East floor sample taken in Feb 1992, shows elevated levels of chromium (220 mg/kg). Considering these elevated levels and also considering that the walls of the pit are constructed of



Page 2  
Mr. Hal J. Pos

cinder block, the concrete and soils underneath and around the pit may still be acting as a source of contamination. Although we are aware of the practical difficulties associated with further sampling in the pit area, it is important to fully delineate the extent of contamination around and underneath the pit area.

#### Monitoring Wells:

Regarding the monitoring of the groundwater in the area, we do not believe that the wells installed have yielded enough information to accurately determine the direction of groundwater flow or to verify whether the aquifer is or is not unacceptably contaminated. First of all, MW-1 is showing the highest level of contamination and thus does not appear to accurately represent background conditions at the site. Secondly, due to the proximity of the Colorado River to the site it seems likely that groundwater flow may have a more westerly component than is indicated in the report. Thirdly, all three wells are aligned along a straight line making it virtually impossible to determine the direction of groundwater flow. Therefore, an additional well placed due west of the pit area and another background well placed further upgradient would triangulate the area and help to better characterize groundwater flow direction.

#### Other Possible Source Areas:

During previous site inspections of Eimco by the Department, it was noted that the area around MW-1 often served as a storage area for used oil, automotive batteries, used equipment, etc. Therefore it seems feasible that chromium containing materials may have also been located in this area at some time and that perhaps MW-1 is actually located in an area of contamination instead of in a background area. Previous inspections also indicate that Eimco used a 750 gallon underground storage tank to collect used oil. This tank also collected drainage from the floor drains in the shop area. Although our records do not specify the location of this underground storage tank, it appears to have been located east of the Eimco building and may be impacting MW-1 results. We suggest that Eimco further investigate the location of this tank and the possibility of chromium materials having been stored near MW-1.

In addition we have noted that MW-3 (14 ppb chromium) is located in the general proximity of Eimco's former septic tank for domestic waste. Since Eimco had no connection to a POTW during the time it occupied the Devereux Road site and ran their chrome plating operations, the septic system and any associated leachfield warrants further careful investigation. Such investigation should include acquiring an accurate history of the septic system, location of the leach field, sampling of the septic tank contents and sampling of soils in leachfield area.

Page 3  
Mr. Hal J. Pos

Summary:

The Department recommends that Eimco do the following in order to further evaluate soil and groundwater contamination at this site:

1. Prepare a soil investigation workplan to fully characterize contamination found around the former chromium plating tank pit. The sampling data shows that the soils in the vicinity of the pit are contaminated with chromium. The plan should also address whether or not the concrete walls and floor of the pit are hazardous waste (for example, characteristic for chromium).
2. Prepare a ground-water sampling workplan whose goal will be to accurately determine the direction of ground water flow and to fully characterize local water quality. The sampling data indicates that a release has impacted the underlying aquifer. Additional wells are needed upgradient of MW-1 and downgradient of the former plating pit area.
3. Prepare a workplan to characterize soil contamination around the used oil underground storage tank, septic tank and associated leachfield. The purpose of this sampling is to evaluate whether these three waste management units are impacting water quality in the underlying aquifer.

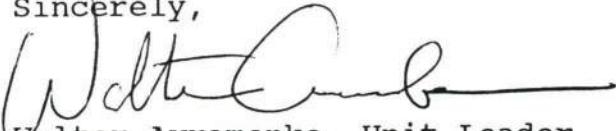
We recommend that Eimco prepare and submit these plans to the Department for our review and approval within 30 days of receipt of this letter. The plans should specify sampling locations, equipment, and analytical methods that will be employed to characterize this contamination. A decision to close the plating tank pit and monitor the ground water can only be made after the magnitude and full extent of the contamination is fully known.

We appreciate Eimco's efforts in dealing with the issue of chromium contamination at this site. The Department usually conducts site investigation/remediation activities such as these under an administrative order on consent, signed by the Department and the facility. However, if work proceeds satisfactorily, as it has to date at the Eimco site, we hope to avoid this step in our management of this case.

Page 4  
Mr. Hal J. Pos

If you have any questions of a technical nature please contact Lillian Gonzalez, of the Department, at (303) 692-3344. Questions of a legal nature should be directed to Daniel Miller, of the Office of the Attorney General, at (303) 866-5129.

Sincerely,

A handwritten signature in black ink, appearing to read 'Walter Avramenko', with a long horizontal stroke extending to the right.

Walter Avramenko, Unit Leader  
Corrective Action Unit  
Hazardous Waste Control Program

pc: John Habets, Eimco Coal Machinery  
Daniel Miller, AGO

eimco-sa

BEFORE THE HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

DEPARTMENT OF HEALTH

STATE OF COLORADO

\*\*\*\*\*  
COMPLIANCE ORDER ON CONSENT NO. 92-04-15-01

\*\*\*\*\*  
IN THE MATTER OF EIMCO COAL MACHINERY, INC.

\*\*\*\*\*  
This Compliance Order on Consent is entered into by the Colorado Department of Health through the Hazardous Materials and Waste Management Division ("the Division") and by Eimco Coal Machinery, Inc. ("Eimco").

Findings of Fact

1. Eimco is a Delaware corporation doing business at 2222 Devereux Road in Glenwood Springs, Colorado.
2. Eimco formerly operated under the name "Baker Mine Service" which was owned by Baker International. The current general manager of Eimco is Mr. Jack Van Hoose.
3. Eimco manufactures and services machinery used in the coal mining industry. Eimco's operations involve mechanical repair, machining of various metals, painting and chrome plating.
4. On September 7, 1990, inspectors from the Division conducted an inspection of Eimco to determine compliance with the Colorado Hazardous Waste Act.
5. During the 1990 inspection, inspectors observed Eimco's chrome plating operation. The tanks for the plating line were positioned in a concrete vault constructed below the floor level of the building. A grate was positioned over the vault and around the tanks to serve as a walking surface. The inspectors observed that liquid was pooled in the bottom of the vault.
6. During the 1990 inspection, Mr. Van Hoose stated that Eimco does not have service to a publicly owned treatment works (POTW). Therefore, according to Mr. Van Hoose, no wastewater from the chrome plating operation leaves Eimco via the POTW. Mr. Van Hoose stated that instead, rinses are reused as makeup water for the plating baths and all spilled material accumulates in the vault underneath the tanks.
7. During the 1990 inspection, inspectors observed a circular tank of approximately 300-400 gallon capacity, located next to the chrome plating area, filled approximately one-half full with an orange brown liquid. Mr. Van Hoose stated that the material was waste which had been pumped from the vault several years ago when snowmelt had seeped into the vault through the concrete walls and combined with plating wastes already in the vault. Mr. Kevin Wakefield, Eimco's chrome plating operator, stated that the previous chrome plating operator had "treated" the waste pumped from the vault and that an additional three barrels of treated waste was being stored outside. Mr. Wakefield stated that he had been Eimco's chrome plating operator for three years, as of the date of the 1990 inspection.
8. During the 1990 inspection, inspectors asked Mr. Wakefield how often the vault is pumped. Mr. Wakefield replied that he had never pumped it in his three years at Eimco as the chrome plating operator.
9. During the 1990 inspection, inspectors requested documentation of lab analysis for the chromium waste stored in the tank and drums. Eimco responded by forwarding a copy of a November 20, 1989 laboratory report, for samples marked "waste barrels", which showed that the chromium concentration in the liquid sample was 480 mg/l.

10. On August 11, 1989, inspectors from the Division conducted an inspection of Eimco to determine compliance with the Colorado Hazardous Waste Act.
11. During the 1989 inspection, inspectors observed two 55-gallon drums which Mr. Van Hoose stated were partially full of waste chromium sludge. According to Mr. Van Hoose, the sludge was generated from filtering liquid which was pooled in the vault below the plating tanks. Mr. Van Hoose stated that the vault had to be pumped because snowmelt had seeped through the vault the previous winter. The inspectors observed liquid in the vault during the 1989 inspection.
12. During the 1990 inspection, inspectors asked Mr. Van Hoose if any waste generated by Eimco had ever been sent off-site for disposal under a hazardous waste manifest. He replied that no waste had. During the 1990 inspection the inspectors asked Mr. Van Hoose if the chromium waste present during the 1989 inspection had been disposed. Mr. Van Hoose stated that he had been trying to arrange for disposal of the waste but the waste was still on site.
13. Eimco does not have a hazardous waste permit issued either by the Division or by the U.S. Environmental Protection Agency and has never been granted interim status for the treatment, storage or disposal of hazardous waste. Eimco has never notified the Division of hazardous waste activity pursuant to 6 CCR 1007-3, Part 99.
14. On or about November 10, 1986, Baker Mine Service notified the Division that it was a generator of ignitable waste and EP Toxic waste. Baker Mine Service ran a similar if not identical operation to Eimco's Baker Mine Service operator out of the same building from which Eimco currently operates (2222 Devereux Road, Glenwood Springs, Colorado).

#### Conclusions of Law

15. A solid waste includes any material which is accumulated, stored, or treated before or in lieu of being abandoned by being disposed, burned or incinerated. 6 CCR 1007-3, Section 261.2(b)(3). Eimco's chromium waste is a solid waste because it is being stored prior to disposal.
16. A solid waste is a hazardous waste if it exhibits any of the characteristics of hazardous waste as defined in 6 CCR 1007-3, Part 261, Subpart C or if it is listed in 6 CCR 1007-3, Part 261, Subpart D. 6 CCR 1007-3, Section 261.3(a).
17. Wastewater treatment sludges from electroplating operations are listed as hazardous wastes with the hazardous waste number F006. 6 CCR 1007-3, Section 261.31. "Sludges" are defined as any solid, semi-solid or liquid waste generated from municipal, commercial or industrial wastewater treatment plant. 6 CCR 1007-3, Section 260.10. The wastes in the 300-400 gallon tank and the 55 gallon drums described in paragraph #7 of this Order on Consent were wastewaters, derived from Eimco's chrome plating operation, which had been treated. These wastes thus are listed wastewater treatment sludges with the hazardous waste number F006.
18. If a conditionally exempt small quantity generator of hazardous waste accumulates more than a total of 1000 kg of hazardous waste on site it becomes subject to the requirements applicable to generators of 100-1000 kg of hazardous waste per month. 6 CCR 1007-3, Section 261.5. Eimco's accumulation of one-half of a 300 gallon container plus three 55-gallon drums of EP toxic chromium waste exceeds this threshold, and makes it subject to the requirements for generators of 100-1000 kg of hazardous waste per month.

Page Three  
Compliance Order on Consent  
Eimco Coal Machinery, Inc.

19. A generator of 100-1000 kg of hazardous waste per month may accumulate hazardous waste on site without a permit for a maximum of 180 days. 6 CCR 1007-3, Section 262.34(d). Eimco's storage of hazardous waste on site for over one year (from at least August 11, 1989 to at least September 7, 1990) without a hazardous waste permit or interim status is a violation of Section 25-15-308(1)(b), C.R.S. (1989).

ORDER ON CONSENT

Based on the foregoing Findings of Fact and Conclusions of Law, and pursuant to Section 25-15-308, C.R.S. (1989), Eimco is hereby ordered and consents to comply with the following:

20. Manage all containers and tanks of hazardous waste as specified in 6 CCR 1007-3, Section 262.34(d) and 6 CCR 1007-3, Part 265, Subpart I (if the waste is placed in containers) or the applicable portions of 6 CCR 1007-3, Part 265, Subpart J (if the waste is placed in tanks).

PENALTIES

21. In full accord and satisfaction of the alleged violations described in this Compliance Order on Consent, Eimco agrees to pay the sum of \$17,100.00 in civil penalties. Payment is due within thirty (30) days of the effective date of this Compliance Order on Consent by certified or cashier's check drawn to the order of "Colorado Department of Health" and delivered to the Hazardous Materials and Waste Management Division at 4210 East 11th Avenue, Denver, Colorado 80220.
22. Without any admission of liability, Eimco hereby consents to issuance of this Compliance Order on Consent and agrees to abide by all of the terms and conditions herein. Eimco understands that violation of this Compliance Order on Consent may subject Eimco to legal action for injunctive relief and for penalties in accordance with Sections 25-15-308(2) and 25-15-309, C.R.S. (1989).

SCOPE AND EFFECT OF AGREEMENT

23. The parties' obligations under this Compliance Order on Consent are limited to the matter expressly stated in the Compliance Order on Consent. Eimco is signing this Compliance Order on Consent to compromise a claim and, as such, the admissibility of this Compliance Order on Consent shall be governed by Colorado and Federal Rules of Evidence 408.
24. In exchange for Eimco's compliance with the provisions of this Compliance Order on Consent and payment of civil penalties, the Department agrees not to initiate any administrative or civil proceedings against Eimco, its officers, directors, agents, servants, employees, attorneys, and all affiliated corporate entities, successors and assigns, past and present, based on facts arising out of or related to this Compliance Order on Consent or other facts currently known to the Department with respect to Eimco's illegal storage of hazardous waste as of the September 7, 1991 inspection. This release, however will not prevent the Department from enforcing the terms of this Compliance Order on Consent, and does not release Eimco from liability for future violations of state hazardous waste laws.

LIMITATION OF LIABILITY

25. The Department shall not be liable for any injury or damages to persons or property arising from acts or omissions of Eimco, its employees, agents or contractors in carrying out the activities pursuant to this Compliance Order on Consent. The Department shall not be considered a party to any contract entered into by Eimco its employees, agents or contractors in



carrying out the activities pursuant to this Compliance Order on Consent, nor shall it be considered an owner or operator of the Eimco facility.

NOTICES

26. Unless otherwise specified, reports, notices, submissions and communications required under this Compliance Order on Consent shall be in writing and shall be sent to:

FOR THE STATE OF COLORADO

Frederick R. Dowsett, Unit Leader  
Hazardous Materials and Waste Management Division  
Colorado Department of Health  
4210 East 11th Avenue  
Denver, Colorado 80220

FOR EIMCO

John Habets, Director of Human Resources  
Eimco Coal Machinery, Inc.  
2030 Pleasant Valley Road  
Fairmont, West Virginia 26554

MODIFICATION

27. This Agreement may be modified in writing upon mutual agreement of the Parties.

TERMINATION DATE

28. This Compliance Order on Consent shall terminate three years after the effective date of this agreement.

COUNTERPARTS

29. This Compliance Order on Consent may be executed in multiple counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same agreement.

BINDING EFFECT AND EFFECTIVE DATE

30. This Compliance Order on Consent is binding upon the parties to the Compliance Order on Consent and their corporate subsidiaries or parents. The undersigned warrant that they are authorized to legally bind their respective principals to this Compliance Order on Consent. This Compliance Order on Consent shall become effective when all required signatures have been obtained.

Page Five  
Compliance Order on Consent  
Eimco Coal Machinery, Inc.

4/13/92  
DATE

FOR THE COLORADO DEPARTMENT OF HEALTH

Frederick R. Dowsett  
BY: Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials & Waste Management  
Division

FOR EIMCO COAL MACHINERY, INC.

4/18/92  
DATE

John Habets  
John Habets, Director of Human Resources  
Eimco Coal Machinery, Inc.

APPROVED AS TO FORM:

4/15/92  
DATE

Daniel S. Miller  
Daniel S. Miller  
First Assistant Attorney General  
Office of the Attorney General

FRD:LG/ccb/8-12

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a. & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

John M. Habets  
Eimco Coal Machinery, Inc.  
2030 Pleasant Valley Road  
Fairmont, West VA 26554

4a. Article Number

P 326 796 071

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

6/2/92

5. Signature (Addressee)

*John M. Habets*

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

☆ U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

P 326 796 071

**RECEIPT FOR CERTIFIED MAIL**

NO INSURANCE COVERAGE PROVIDED  
NOT FOR INTERNATIONAL MAIL

(See Reverse)

U.S.G.P.O. 1989-234-555

Form 3800, June 1985

|                                                               |          |
|---------------------------------------------------------------|----------|
| Sent to John Habets                                           |          |
| Eimco Coal Machinery                                          |          |
| Street and No                                                 |          |
| 2030 Pleasant Valley                                          |          |
| P.O., State and ZIP Code                                      |          |
| Fairmont, West VA                                             |          |
| Postage                                                       | \$ 26554 |
| Certified Fee                                                 |          |
| Special Delivery Fee                                          |          |
| Restricted Delivery Fee                                       |          |
| Return Receipt showing to whom and Date Delivered             |          |
| Return Receipt showing to whom, Date, and Address of Delivery |          |
| TOTAL Postage and Fees                                        | \$       |
| Postmark or Date                                              |          |



ROY ROME,  
Governor

PATRICIA A. NOLAN, MD, MPH  
Executive Director

4210 East 11th Avenue  
Denver, Colorado 80220-3716  
Phone (303) 320-8333

*Tel. numbers:*

Main building, Denver  
(303) 322-9076

Ptarmigan Place, Denver  
(303) 320-1529

First National Bank Building, Denver  
(303) 355-6559

Grand Junction Office  
(303) 248-7198

Pueblo Office  
(719) 543-8441

Certified Mail # P 326 796 023  
RETURN RECEIPT REQUESTED

April 3, 1992

Mr. John Habets  
Director of Human Resources  
Eimco Coal Machinery, Inc.  
2030 Pleasant Valley Road  
Fairmont, WV 26554

RE: Hazardous Materials and Waste Management Division  
Compliance Order No. 91-03-26-02  
Offer to Compromise Regarding Civil Penalties

Dear Mr. Habets:

On March 26, 1991, Eimco Coal Machinery, Inc. ("Eimco") was served with a compliance order issued by the Hazardous Materials and Waste Management Division of the Colorado Department of Health ("the Division") pursuant to Section 25-15-308(2), C.R.S. (1989). The Division issued this order based upon its finding that Eimco had violated the Colorado Hazardous Waste Act ("the Act") by illegally storing hazardous waste.

Section 25-15-308(2) authorizes the Division to request that the Attorney General of Colorado bring suit for injunctive relief and for penalties pursuant to Sections 25-15-309 and 25-15-310, respectively. Section 25-15-309 provides that the court may assess and collect penalties of up to \$25,000 for each day of each violation of the Act and the regulation implementing the Act. This letter constitutes the Division's offer to compromise its judicial claims for civil penalties against Eimco in accordance with the following terms.

The Division has reviewed the information concerning the violations(s) available to it and has analyzed the seriousness of the violations(s), and the potential for harm. Based on these factors, the Division believes that a total penalty of \$17,100.00 is appropriate. The Division, therefore, will agree in writing to settle its claims against Eimco in exchange for: Eimco's signing of the enclosed compliance order on consent and delivery of a cashier's check or certified funds in the amount of \$17,100.00 (payable to the Colorado Department of Health) within 30 days of the effective date of the enclosed compliance order on consent. Please note that a revised Penalty Computation Worksheet is also enclosed.

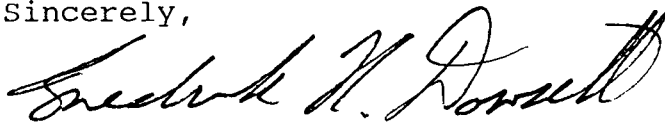
Page Two  
Eimco Coal Machinery, Inc.

If you do not accept this offer to compromise, the Division may, without further notice, ask the Attorney general of Colorado to bring suit against Eimco for penalties and, if appropriate, injunctive relief pursuant to the Act. You should be aware that in such event the Division's request to the Court regarding the amount of penalties will not be bound or limited in any way by this offer to compromise.

Should you have any questions, please contact Lillian Gonzalez at (303) 331-4873. I believe that a speedy resolution of this matter is in the best interests of both Eimco and the people of Colorado.

This offer to compromise shall not be admissible to prove the validity for or invalidity of any claim or its amount pursuant to Colorado and Federal Rules of Evidence 408.

Sincerely,

A handwritten signature in black ink, appearing to read "Frederick R. Dowsett", with a stylized flourish at the end.

Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials & Waste Management Division

cc: Daniel Miller, AGO  
Jack Van Hoose, Eimco

Enclosures

FRD:LG/ccb/32-33





ROY ROMEO  
Governor

PATRICIA A. NOLAN, MD, MPH  
Executive Director

4210 East 11th Avenue  
Denver, Colorado 80220-3716  
Phone (303) 320-8333

*Tel. numbers:*

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Certified Mail # P 326 796 023  
RETURN RECEIPT REQUESTED

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Eimco Coal Machinery, Inc.  
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Fairmont, WV 26554

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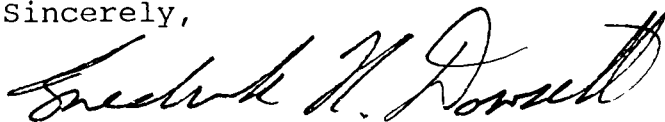
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Monitoring & Enforcement  
Hazardous Materials & Waste Management Division

cc: Daniel Miller, AGO  
Jack Van Hoose, Eimco

Enclosures

FRD:LG/ccb/32-33

BEFORE THE HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

DEPARTMENT OF HEALTH

STATE OF COLORADO

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Compliance Order on Consent  
Eimco Coal Machinery, Inc.

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ORDER ON CONSENT

Based on the foregoing Findings of Fact and Conclusions of Law, and pursuant to Section 25-15-308, C.R.S. (1989), Eimco is hereby ordered and consents to comply with the following:

20. Manage all containers and tanks of hazardous waste as specified in 6 CCR 1007-3, Section 262.34(d) and 6 CCR 1007-3, Part 265, Subpart I (if the waste is placed in containers) or the applicable portions of 6 CCR 1007-3, Part 265, Subpart J (if the waste is placed in tanks).

PENALTIES

21. In full accord and satisfaction of the alleged violations described in this Compliance Order on Consent, Eimco agrees to pay the sum of \$17,100.00 in civil penalties. Payment is due within thirty (30) days of the effective date of this Compliance Order on Consent by certified or cashier's check drawn to the order of "Colorado Department of Health" and delivered to the Hazardous Materials and Waste Management Division at 4210 East 11th Avenue, Denver, Colorado 80220.
22. Without any admission of liability, Eimco hereby consents to issuance of this Compliance Order on Consent and agrees to abide by all of the terms and conditions herein. Eimco understands that violation of this Compliance Order on Consent may subject Eimco to legal action for injunctive relief and for penalties in accordance with Sections 25-15-308(2) and 25-15-309, C.R.S. (1989).

SCOPE AND EFFECT OF AGREEMENT

23. The parties' obligations under this Compliance Order on Consent are limited to the matter expressly stated in the Compliance Order on Consent. Eimco is signing this Compliance Order on Consent to compromise a claim and, as such, the admissibility of this Compliance Order on Consent shall be governed by Colorado and Federal Rules of Evidence 408.
24. In exchange for Eimco's compliance with the provisions of this Compliance Order on Consent and payment of civil penalties, the Department agrees not to initiate any administrative or civil proceedings against Eimco, its officers, directors, agents, servants, employees, attorneys, and all affiliated corporate entities, successors and assigns, past and present, based on facts arising out of or related to this Compliance Order on Consent or other facts currently known to the Department with respect to Eimco's illegal storage of hazardous waste as of the September 7, 1991 inspection. This release, however will not prevent the Department from enforcing the terms of this Compliance Order on Consent, and does not release Eimco from liability for future violations of state hazardous waste laws.

LIMITATION OF LIABILITY

25. The Department shall not be liable for any injury or damages to persons or property arising from acts or omissions of Eimco, its employees, agents or contractors in carrying out the activities pursuant to this Compliance Order on Consent. The Department shall not be considered a party to any contract entered into by Eimco its employees, agents or contractors in

carrying out the activities pursuant to this Compliance Order on Consent, nor shall it be considered an owner or operator of the Eimco facility.

NOTICES

26. Unless otherwise specified, reports, notices, submissions and communications required under this Compliance Order on Consent shall be in writing and shall be sent to:

FOR THE STATE OF COLORADO

Frederick R. Dowsett, Unit Leader  
Hazardous Materials and Waste Management Division  
Colorado Department of Health  
4210 East 11th Avenue  
Denver, Colorado 80220

FOR EIMCO

John Habets, Director of Human Resources  
Eimco Coal Machinery, Inc.  
2030 Pleasant Valley Road  
Fairmont, West Virginia 26554

MODIFICATION

27. This Agreement may be modified in writing upon mutual agreement of the Parties.

TERMINATION DATE

28. This Compliance Order on Consent shall terminate three years after the effective date of this agreement.

COUNTERPARTS

29. This Compliance Order on Consent may be executed in multiple counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same agreement.

BINDING EFFECT AND EFFECTIVE DATE

30. This Compliance Order on Consent is binding upon the parties to the Compliance Order on Consent and their corporate subsidiaries or parents. The undersigned warrant that they are authorized to legally bind their respective principals to this Compliance Order on Consent. This Compliance Order on Consent shall become effective when all required signatures have been obtained.

Page Five  
Compliance Order on Consent  
Eimco Coal Machinery, Inc.

FOR THE COLORADO DEPARTMENT OF HEALTH

\_\_\_\_\_  
DATE

\_\_\_\_\_  
BY: Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials & Waste Management  
Division

FOR EIMCO COAL MACHINERY, INC.

\_\_\_\_\_  
DATE

\_\_\_\_\_  
John Habets, Director of Human Resources  
Eimco Coal Machinery, Inc.

APPROVED AS TO FORM:

\_\_\_\_\_  
DATE

\_\_\_\_\_  
Daniel S. Miller  
First Assistant Attorney General  
Office of the Attorney General

FRD:LG/ccb/8-12



**SENDER:**

- Complete items 1 and/or 2 for additional service.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

John Habets  
Eimco Coal Machinery, Inc.  
2030 Pleasant Valley Road  
Fairmont, WV 26554

4a. Article Number

P 326 796 023

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

4-7-92 Ek

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

☆ U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

P 326 796 023

**RECEIPT FOR CERTIFIED MAIL**

NO INSURANCE COVERAGE PROVIDED  
NOT FOR INTERNATIONAL MAIL  
(See Reverse)

U.S.G.P.O. 1989-234-555

PS Form 3800, June 1985

|                                                               |    |
|---------------------------------------------------------------|----|
| Sent to John Habets                                           |    |
| Eimco Coal Machinery                                          |    |
| Street and No                                                 |    |
| 2030 Pleasant Valley                                          |    |
| P.O., State and ZIP Code                                      |    |
| FAIRMONT, WV 26554                                            |    |
| Postage                                                       | \$ |
| Certified Fee                                                 |    |
| Special Delivery Fee                                          |    |
| Restricted Delivery Fee                                       |    |
| Return Receipt showing to whom and Date Delivered             |    |
| Return Receipt showing to whom, Date, and Address of Delivery |    |
| TOTAL Postage and Fees                                        | \$ |
| Postmark or Date                                              |    |



4210 East 11th Avenue  
Denver, Colorado 80220-3716  
Phone (303) 320-8333

Hazardous Materials and  
Waste Management Division  
Telefax Number: (303) 331-4401

Telefax Numbers:  
Main Building/Denver  
(303) 322-9076

Parmigan Place/Denver  
(303) 320-1529

First National Bank Building/Denver  
(303) 355-6559

Grand Junction Office  
(303) 248-7198

Pueblo Office  
(719) 543-8441

ROY ROMER  
Governor

JOEL KOHN  
Interim Executive Director

Mr. Jack Van Hoose  
Eimco Coal Machinery, Inc.  
P.O. Box 1755  
Price, UT 84501

March 30, 1992

RE: Extension of Accumulation  
Period Under Colorado  
Hazardous Waste Regulations  
EPA ID# COD983785619

COD 98 154 4768

Dear Mr. Van Hoose:

This will confirm that we have received your March 9, 1992 request for an extension of the 90-day hazardous waste accumulation period.

Under authority granted to the Department by 6 CCR 1007-3, part 262.34(b), you have been granted a 30-day extension to the 90-day accumulation period. This 30-day extension ends on April 10, 1992. Since the regulations do not provide for any additional extensions, you are advised to take steps to properly dispose of the material as a hazardous waste within the extension period. As confirmation of such, please forward a copy of the manifest to the Department within 10 days of shipping the waste.

If you have any questions or if any further problems arise, please contact Lillian Gonzalez at (303) 331-4873.

Sincerely,

Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials & Waste Management Division

FRD:LG/ccb/2



**COLORADO**  
**DEPARTMENT**  
**OF HEALTH**

4210 East 11th Avenue  
Denver, Colorado 80220-3716  
Phone (303) 320-8333

Telefax Numbers:  
Main Building/Denver  
(303) 322-9076

Parmigan Place/Denver  
(303) 320-1529

First National Bank Building/Denver  
(303) 355-6559

Grand Junction Office  
(303) 248-7198

Pueblo Office  
(719) 543-8441

**ROY ROMER**  
Governor

**JOEL KOHN**  
Interim Executive Director

POD 981544786

July 24, 1991

CERTIFIED MAIL # P 561501102  
Return Receipt Requested

Mr. Jack Van Hoose  
Eimco Coal Machinery, Inc.  
P.O. Box 844  
Glenwood Springs, CO 81602

Re: Hazardous Materials and Waste Management Division  
Compliance Order No. 91-03-26-02  
Record of Informal Conference  
- and -  
Service of Amended Compliance Order

Dear Mr. Van Hoose:

On behalf of the Hazardous Materials and Waste Management Division of the Colorado Department of Health ("the Division"), I would like to thank you and Eimco Coal Machinery, Inc. ("Eimco") for taking time to meet informally with the Division on April 9, 1991 to discuss the violation of the Colorado Hazardous Waste Act described in Compliance Order No. 91-03-26-02. This letter summarizes our informal conference and articulates the Division's final position with regard to this case.

Compliance Order No. 91-03-26-02 contains the Division's findings that Eimco violated the Colorado Hazardous Waste Act by storing hazardous wastes on site in excess of the allowable time periods. At the informal conference you indicated that the wastes cited in the order had either been sent to an authorized hazardous waste facility or is scheduled for disposal in the near future. You also indicated that an updated notification of hazardous waste activity had been submitted to the Department. My staff and I have reviewed the case, including the information offered at the conference.

Based upon this information, the Division has concluded that the Compliance Order should be revised to reflect the information you submitted. The Division, therefore, withdraws Compliance Order No. 91-03-26-02 and in its place, hereby serves you with Amended Compliance Order No. 91-03-26-02. This Amended Compliance Order contains the Division's final factual determinations in this matter. The enclosed Amended Compliance Order will become effective ten (10) calendar days after the date on which you receive this letter.

In addition, the Division encourages Eimco to investigate the integrity of their plating sump and ensure its contents do not pose a threat to human health or the environment. A leak test and application or reapplication of an impervious coating may be appropriate.

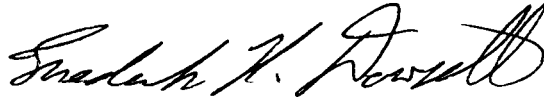
Mr. Jack Van Hoose  
Eimco Coal Machinery, Inc.  
Page Two

You are also hereby notified that the Division intends to seek a civil penalty from Eimco in this matter as authorized by Sections 25-15-308 and 309, C.R.S. (1989). You are being notified of the amount the Division would be willing to settle for, along with any conditions the offer would be subject to, by separate letter.

Should you desire to discuss the technical aspects of this matter, you may call Lillian Gonzalez at the Department of Health at (303) 331-4873. If you wish to discuss the legal aspects of this case, please contact Daniel Miller at the Colorado Attorney General's Office at (303) 620-4732.

I urge you to give this matter your immediate attention.

Sincerely,



Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials & Waste Management Division

cc: Daniel S. Miller, AGO  
Charles Brinkman, EPA  
Thomas Burns, EPA

FRD:LG/cal  
8308K:7-8

BEFORE THE HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION  
DEPARTMENT OF HEALTH  
STATE OF COLORADO

\*\*\*\*\*

AMENDED COMPLIANCE ORDER      NO. 91-03-26-02

\*\*\*\*\*

IN THE MATTER OF EIMCO COAL MACHINERY, INC.

\*\*\*\*\*

This Compliance Order is issued by the Colorado Department of Health through the Hazardous Materials and Waste Management Division ("the Division") to Eimco Coal Machinery, Inc. ("Eimco") pursuant to the Division's authority under Section 25-15-308, C.R.S. (1989).

Findings of Fact

1. Eimco is a Delaware corporation doing business at 2222 Devereux Road in Glenwood Springs, Colorado.
2. Eimco formerly operated under the name "Baker Mine Service" which was owned by Baker International. The current general manager of Eimco is Mr. Jack Van Hoose.
3. Eimco manufactures and services machinery used in the coal mining industry. Eimco's operations involve mechanical repair, machining of various metals, painting and chrome plating.
4. On September 7, 1990, inspectors from the Division conducted an inspection of Eimco to determine compliance with the Colorado Hazardous Waste Act.
5. During the 1990 inspection, inspectors observed Eimco's chrome plating operation. The tanks for the plating line were positioned in a concrete vault constructed below the floor level of the building. A grate was positioned over the vault and around the tanks to serve as a walking surface. The inspectors observed that liquid was pooled in the bottom of the vault.
6. During the 1990 inspection, Mr. Van Hoose stated that Eimco does not have service to a publicly owned treatment works (POTW). Therefore, according to Mr. Van Hoose, no wastewater from the chrome plating operation leaves Eimco via the POTW. Mr. Van Hoose stated that instead, rinses are reused as makeup water for the plating baths and all spilled material accumulates in the vault underneath the tanks.

7. During the 1990 inspection, inspectors observed a circular tank of approximately 300-400 gallon capacity, located next to the chrome plating area, filled approximately one-half full with an orange brown liquid. Mr. Van Hoose stated that the material was waste which had been pumped from the vault several years ago when snowmelt had seeped into the vault through the concrete walls and combined with plating wastes already in the vault. Mr. Kevin Wakefield, Eimco's chrome plating operator, stated that the previous chrome plating operator had "treated" the waste pumped from the vault and that an additional three barrels of treated waste was being stored outside. Mr. Wakefield stated that he had been Eimco's chrome plating operator for three years, as of the date of the 1990 inspection.
8. During the 1990 inspection, inspectors asked Mr. Wakefield how often the vault is pumped. Mr. Wakefield replied that he had never pumped it in his three years at Eimco as the chrome plating operator.
9. During the 1990 inspection, inspectors requested documentation of lab analysis for the chromium waste stored in the tank and drums. Eimco responded by forwarding a copy of a November 30, 1989 laboratory report, for samples marked "waste barrels", which showed that the chromium concentration in the liquid sample was 480 mg/l.
10. On August 11, 1989, inspectors from the Division conducted an inspection of Eimco to determine compliance with the Colorado Hazardous Waste Act.
11. During the 1989 inspection, inspectors observed two 55-gallon drums which Mr. Van Hoose stated were partially full of waste chromium sludge. According to Mr. Van Hoose, the sludge was generated from filtering liquid which was pooled in the vault below the plating tanks. Mr. Van Hoose stated that the vault had to be pumped because snowmelt had seeped through the vault the previous winter. The inspectors observed liquid in the vault during the 1989 inspection.
12. During the 1990 inspection, inspectors asked Mr. Van Hoose if any waste generated by Eimco had ever been sent off-site for disposal under a hazardous waste manifest. He replied that no waste had. During the 1990 inspection the inspectors asked Mr. Van Hoose if the chromium waste present during the 1989 inspection had been disposed. Mr. Van Hoose stated that he had been trying to arrange for disposal of the waste but the waste was still on site.
13. Eimco does not have a hazardous waste permit issued either by the Division or by the U.S. Environmental Protection Agency and has never been granted interim status for the treatment, storage or disposal of hazardous waste.
14. On or about November 10, 1986, Baker Mine Service notified the Division that it was a generator of ignitable waste and EP Toxic waste. Baker Mine Service ran a similar if not identical operation to Eimco's. Baker Mine Service operated out of the same building from which Eimco currently operates (2222 Devereux Road, Glenwood Springs, Colorado).

#### Conclusions of Law

15. A solid waste includes any material which is accumulated, stored, or treated before or in lieu of being abandoned by being disposed, burned or incinerated. 6 CCR 1007-3, Section 261.2(b)(3). Eimco's chromium waste is a solid waste because it is being stored prior to disposal.



16. A solid waste is a hazardous waste if it exhibits any of the characteristics of hazardous waste as defined in 6 CCR 1007-3, Part 261, Subpart C or if it is listed in 6 CCR 1007-3, Part 261, Subpart D. 6 CCR 1007-3, Section 261.3(a).
17. Wastewater treatment sludges from electroplating operations are listed as hazardous wastes with the hazardous waste number F006. 6 CCR 1007-3, Section 261.31. "Sludges" are defined as any solid, semi-solid or liquid waste generated from municipal, commercial or industrial wastewater treatment plant. 6 CCR 1007-3, Section 260.10. The wastes in the 300-400 gallon tank and the 55 gallon drums described in paragraph #7 of this Order were wastewaters, derived from Eimco's chrome plating operation, which had been treated. These wastes thus are listed wastewater treatment sludges with the hazardous waste number F006.
18. If a conditionally exempt small quantity generator of hazardous waste accumulates more than a total of 1000 kg of hazardous waste on site it becomes subject to the requirements applicable to generators of 100-1000 kg of hazardous waste per month. 6 CCR 1007-3, Section 261.5. Eimco's accumulation of one-half of a 300 gallon container plus three 55-gallon drums of EP toxic chromium waste exceeds this threshold, and makes it subject to the requirements for generators of 100-1000 kg of hazardous waste per month.
19. A generator of 100-1000 kg of hazardous waste per month may accumulate hazardous waste on site without a permit for a maximum of 180 days. 6 CCR 1007-3, Section 262.34(d). Eimco's storage of hazardous waste on site for over one year (from at least August 11, 1989 to at least September 7, 1990) without a hazardous waste permit or interim status is a violation of Section 25-15-308(1)(b), C.R.S., (1989).

### ORDER

Based on the foregoing Findings of Fact and Conclusions of Law, and pursuant to Section 25-15-308, C.R.S. (1989), Eimco is hereby ordered to comply with the following:

20. Within 30 days of the effective date of this Order, Eimco must submit documentation that all hazardous wastes stored in excess of the allowable time limits have been sent off site to a facility which is authorized for the treatment, storage, or disposal of hazardous waste. The documentation must at least include all manifests, waste profiles, any additional reports of analyses and any other shipping paperwork. Eimco must also submit written verification that all future wastes generated will be managed according to the applicable portions of 6 CCR 1007-3. The applicable portions include, but are not limited to, those which specify storage time limits (6 CCR 1007-3, Section 262.34) and those which specify the proper management of hazardous waste containers and tanks (6 CCR 1007-3, Section 262.34(d); 6 CCR 1007-3, Part 265, Subparts I & J), including proper labeling.

NOTICE OF LIABILITY FOR CIVIL  
PENALTIES AND INJUNCTIVE RELIEF

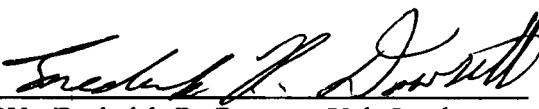
Section 25-15-309, C.R.S. (1989), provides that any person who violates the Hazardous Waste Act, Sections 25-15-101 to 313, C.R.S. (1989), the regulations implementing the Act, 6 CCR 1007-3, or any compliance order of the Department of Health which is not subject to a stay pending judicial review, shall be subject to a civil penalty of not more than \$25,000 per violation for each day during which such violation occurs. The Colorado Department of Health may request that the Attorney General bring suit for injunctive relief or civil or criminal penalties or both for failure to comply with Section 25-15-308 and this Order.

NOTICE OF EFFECTIVE DATE OF ORDER

This Order shall become effective 10 days after receipt.

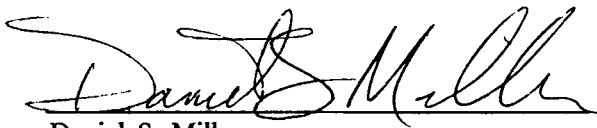
COLORADO DEPARTMENT OF HEALTH

7/22/91  
DATE

  
BY: Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials and Waste Management  
Division

APPROVED AS TO FORM BY:

7/18/91  
DATE

  
Daniel S. Miller  
First Assistant Attorney General  
Natural Resources Section  
110 16th Street, 10th Floor  
Denver, CO 80202  
(303) 620-4732

FRD:LG/cal  
8308K:1-4

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested

1. ☒ Show to whom delivered, date, and addressee's address. (Extra charge) 2. ☐ Restricted Delivery (Extra charge)

|                                                                                                                                                                                                                                                                         |                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| 3. Article Addressed to:<br>MR. JACK VAN HOOSE<br>EIMCO COAL MACHINERY, INC.<br>P.O. BOX 844<br>Glenwood Springs, CO 81602                                                                                                                                              | 4. Article Number<br>P561501102                         |
| Type of Service:<br><input type="checkbox"/> Registered <input type="checkbox"/> Insured<br><input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD<br><input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise |                                                         |
| Always obtain signature of addressee or agent and <b>DATE DELIVERED.</b>                                                                                                                                                                                                |                                                         |
| 5. Signature — Addressee<br>X                                                                                                                                                                                                                                           | 8. Addressee's Address (ONLY if requested and fee paid) |
| 6. Signature — Agent<br>X <i>Ronda Dietrich</i>                                                                                                                                                                                                                         |                                                         |
| 7. Date of Delivery                                                                                                                                                                                                                                                     |                                                         |

PS Form 3811, Apr. 1989

\* U.S.G.P.O. 1989-238-815

DOMESTIC RETURN RECEIPT

PS Form 3800, June 1985

U.S.G.P.O. 1989-234-555

|                                                               |                                   |
|---------------------------------------------------------------|-----------------------------------|
| Sent to <b>MR. JACK VAN HOOSE</b>                             |                                   |
| <b>EIMCO COAL MACHINERY, INC.</b>                             |                                   |
| Street and No.                                                | <b>P.O. BOX 844</b>               |
| P.O. State and ZIP Code                                       | <b>Glenwood Springs, CO 81602</b> |
| Postage                                                       | \$                                |
| Certified Fee                                                 |                                   |
| Special Delivery Fee                                          |                                   |
| Restricted Delivery Fee                                       |                                   |
| Return Receipt showing to whom and Date Delivered             |                                   |
| Return Receipt showing to whom, Date, and Address of Delivery |                                   |
| TOTAL Postage and Fees                                        | \$                                |
| Postmark or Date                                              |                                   |

RECEIPT FOR CERTIFIED MAIL  
NO INSURANCE COVERAGE PROVIDED  
NOT FOR INTERNATIONAL MAIL  
(See Reverse)

P 561 501 102



**COLORADO**  
**DEPARTMENT**  
**OF HEALTH**

ROY ROMER  
Governor

JOEL KOHN  
Interim Executive Director

4210 East 11th Avenue  
Denver, Colorado 80220-3716  
Phone (303) 320-8333

Telefax Numbers:  
Main Building/Denver  
(303) 322-9076

Ptarmigan Place/Denver  
(303) 320-1529

First National Bank Building/Denver  
(303) 355-6559

Grand Junction Office  
(303) 248-7198

March 26, 1991

CERTIFIED MAIL # P 561 501 067  
Return Receipt Requested

The Corporation Company  
1600 Broadway  
Denver, CO 80202

RE: Hazardous Materials & Waste Management Division  
**Eimco Coal Machinery Inc.**  
Compliance Order # 91-03-26-02  
- and -  
Invitation to Informal Conference

Dear Sir or Madam:

You are hereby served with Compliance Order No. 91-03-26-02 issued by the Hazardous Materials and Waste Management Division of the Colorado Department of Health ("the Division") pursuant to Section 25-15-308(2), C.R.S. (1989). This Order is based upon findings by the Division that Eimco Coal Machinery Inc. ("Eimco") has violated the Colorado Hazardous Waste Act, Sections 25-15-301 through 313, C.R.S. (1989) ("the Act"), as more particularly described in the enclosed Compliance Order.

Please take note that the Division will meet with you, at your request, after your receipt of this Order to discuss the Order and receive any evidence or arguments Eimco may have concerning the existence or gravity of the violation(s). I urge you to take advantage of the opportunity to discuss this matter with the Division. If you do not request a meeting, you are hereby notified that the enclosed Compliance Order will become effective ten (10) calendar days after the date on which you receive this letter.

You are also hereby notified that the Division intends to seek a civil penalty from Eimco in this matter as authorized by Sections 25-15-308 and 309 of the Act. The amount of the penalty will be influenced by a variety of factors including the seriousness of the violation(s), the potential for harm resulting from the violation(s) and the performance of Eimco in quickly complying with the terms of the enclosed Compliance Order. A copy of the penalty policy used by the Division will be made available to you upon request. The Act authorizes the Division to seek penalties of up to \$25,000 for each day of each violation of the Act, the regulations implementing the Act, or the enclosed Order.

The Corporation Company  
Page Two

Should you desire to schedule a meeting or to discuss the technical aspects of this matter, you may call Lillian Gonzalez at the Division (telephone (303) 331-4873). If you have retained legal counsel, he or she may contact Daniel S. Miller at the Colorado Attorney General's Office (telephone (303) 620-4732) to discuss legal aspects of the case.

I urge you to give this matter your immediate attention.

Sincerely,



Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials & Waste Management Division

Enclosure: Compliance Order # 91-03-26-02

cc w/encl: Jack Van Hoose, Eimco  
Thomas Burns, EPA  
Charlie Brinkman, EPA

FRD:LG/cal  
8308K:6-7

BEFORE THE HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION  
DEPARTMENT OF HEALTH  
STATE OF COLORADO

\*\*\*\*\*

COMPLIANCE ORDER

NO. 91-03-26-02

\*\*\*\*\*

IN THE MATTER OF EIMCO COAL MACHINERY, INC.

\*\*\*\*\*

This Compliance Order is issued by the Colorado Department of Health through the Hazardous Materials and Waste Management Division ("the Division") to Eimco Coal Machinery, Inc. ("Eimco") pursuant to the Division's authority under Section 25-15-308, C.R.S. (1989).

Findings of Fact

1. Eimco is a Delaware corporation doing business at 2222 Devereux Road in Glenwood Springs, Colorado.
2. Eimco formerly operated under the name "Baker Mine Service" which was owned by Baker International. The current general manager of Eimco is Mr. Jack Van Hoose.
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8. During the 1990 inspection, inspectors asked Mr. Wakefield how often the vault is pumped. Mr. Wakefield replied that he had never pumped it in his three years at Eimco as the chrome plating operator.
9. During the 1990 inspection, inspectors requested documentation of lab analysis for the chromium waste stored in the tank and drums. Eimco responded by forwarding a copy of a November 30, 1989 laboratory report, for samples marked "waste barrels", which showed that the chromium concentration in the liquid sample was 480 mg/l.
10. On August 11, 1989, inspectors from the Division conducted an inspection of Eimco to determine compliance with the Colorado Hazardous Waste Act.
11. During the 1989 inspection, inspectors observed two 55-gallon drums which Mr. Van Hoose stated were partially full of waste chromium sludge. According to Mr. Van Hoose, the sludge was generated from filtering liquid which was pooled in the vault below the plating tanks. Mr. Van Hoose stated that the vault had to be pumped because snowmelt had seeped through the vault the previous winter. The inspectors observed liquid in the vault during the 1989 inspection.
12. During the 1990 inspection, inspectors asked Mr. Van Hoose if any waste generated by Eimco had ever been sent off-site for disposal under a hazardous waste manifest. He replied that no waste had. During the 1990 inspection the inspectors asked Mr. Van Hoose if the chromium waste present during the 1989 inspection had been disposed. Mr. Van Hoose stated that he had been trying to arrange for disposal of the waste but the waste was still on site.
13. Eimco does not have a hazardous waste permit issued either by the Division or by the U.S. Environmental Protection Agency and has never been granted interim status for the treatment, storage or disposal of hazardous waste. Eimco has never notified the Division of hazardous waste activity pursuant to 6 CCR 1007-3, Part 99.
14. On or about November 10, 1986, Baker Mine Service notified the Division that it was a generator of ignitable waste and EP Toxic waste. Baker Mine Service ran a similar if not identical operation to Eimco's. Baker Mine Service operated out of the same building from which Eimco currently operates (2222 Devereux Road, Glenwood Springs, Colorado).

#### Conclusions of Law

15. A solid waste includes any material which is accumulated, stored, or treated before or in lieu of being abandoned by being disposed, burned or incinerated. 6 CCR 1007-3, Section 261.2(b)(3). Eimco's chromium waste is a solid waste because it is being stored prior to disposal.

16. A solid waste is a hazardous waste if it exhibits any of the characteristics of hazardous waste as defined in 6 CCR 1007-3, Part 261, Subpart C or if it is listed in 6 CCR 1007-3, Part 261, Subpart D. 6 CCR 1007-3, Section 261.3(a).
17. Wastewater treatment sludges from electroplating operations are listed as hazardous wastes with the hazardous waste number F006. 6 CCR 1007-3, Section 261.31. "Sludges" are defined as any solid, semi-solid or liquid waste generated from municipal, commercial or industrial wastewater treatment plant. 6 CCR 1007-3, Section 260.10. The wastes in the 300-400 gallon tank and the 55 gallon drums described in paragraph #7 of this Order were wastewaters, derived from Eimco's chrome plating operation, which had been treated. These wastes thus are listed wastewater treatment sludges with the hazardous waste number F006.
18. If a conditionally exempt small quantity generator of hazardous waste accumulates more than a total of 1000 kg of hazardous waste on site it becomes subject to the requirements applicable to generators of 100-1000 kg of hazardous waste per month. 6 CCR 1007-3, Section 261.5. Eimco's accumulation of one-half of a 300 gallon container plus three 55-gallon drums of EP toxic chromium waste exceeds this threshold, and makes it subject to the requirements for generators of 100-1000 kg of hazardous waste per month.
19. A generator of 100-1000 kg of hazardous waste per month may accumulate hazardous waste on site without a permit for a maximum of 180 days. 6 CCR 1007-3, Section 262.34(d). Eimco's storage of hazardous waste on site for over one year (from at least August 11, 1989 to at least September 7, 1990) without a hazardous waste permit or interim status is a violation of Section 25-15-308(1)(b), C.R.S., (1989).

#### ORDER

Based on the foregoing Findings of Fact and Conclusions of Law, and pursuant to Section 25-15-308, C.R.S. (1989), Eimco is hereby ordered to comply with the following:

20. Immediately begin managing all containers of hazardous waste as specified in 6 CCR 1007-3, Section 262.34(d) and 6 CCR 1007-3, Part 265, Subpart I (if the waste is placed in containers) or the applicable portions of 6 CCR 1007-3, Part 265, Subpart J (if the waste is placed in tanks). These requirements include, but are not limited to, labeling hazardous waste tanks and/or containers with the words "hazardous waste" and with an accumulation start date.
21. Within 30 days of the effective date of this Compliance Order, Eimco must submit a written plan detailing the designated disposal site, method of disposal, volume of waste disposed, projected date of waste shipment, waste analysis/profiles and any other pertinent information regarding the treatment and disposal of the chrome wastewater treatment sludge currently stored on-site. Plans for the management of future wastes generated shall be included.
22. Within 30 days of the effective date of this Compliance Order, submit an updated Notification of Hazardous Waste Activity (Form 8700-12).

**NOTICE OF LIABILITY FOR CIVIL  
PENALTIES AND INJUNCTIVE RELIEF**

Section 25-15-309, C.R.S. (1989), provides that any person who violates the Hazardous Waste Act, Sections 25-15-101 to 313, C.R.S. (1989), the regulations implementing the Act, 6 CCR 1007-3, or any compliance order of the Department of Health which is not subject to a stay pending judicial review, shall be subject to a civil penalty of not more than \$25,000 per violation for each day during which such violation occurs. The Colorado Department of Health may request that the Attorney General bring suit for injunctive relief or civil or criminal penalties or both for failure to comply with Section 25-15-308 and this Order. The Compliance Order deadlines will remain as stated herein unless modified subsequent to the informal conference.

**NOTICE OF EFFECTIVE DATE OF ORDER**

Unless you request an informal conference (pursuant to the following paragraph) within 10 days of receipt of this Order, this Order shall then become effective immediately. Should you request an informal conference, the above compliance deadlines, excepting the deadlines specified in paragraph 20 are suspended pending further notice to be issued after such conference.

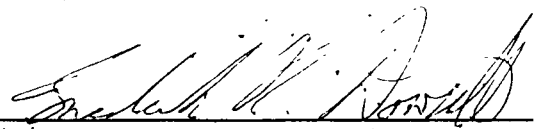
**OPPORTUNITY TO REQUEST  
INFORMAL CONFERENCE**

If you wish to contest any findings made herein or explain any circumstances that tend to mitigate the violation(s), you may request an informal conference within 10 calendar days of the receipt of the Compliance Order. The Division will schedule a conference to be held within 20 days of your receipt of this Compliance Order. Although this conference is an informal proceeding, you may, if you so desire, have legal counsel attend with you. Should you wish to schedule an informal conference, or should you have any questions regarding this Compliance Order, contact:

Lillian Gonzalez  
Monitoring & Enforcement Unit  
Hazardous Materials & Waste Management Division  
Colorado Department of Health  
4210 East 11th Avenue  
Denver, Colorado 80220  
(303) 331-4873

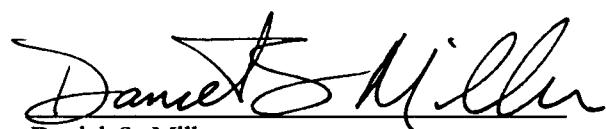
COLORADO DEPARTMENT OF HEALTH

3/25/91  
DATE

  
BY: Frederick R. Dowsett, Unit Leader  
Monitoring & Enforcement  
Hazardous Materials and Waste Management  
Division

APPROVED AS TO FORM BY:

3/25/91  
DATE

  
Daniel S. Miller  
First Assistant Attorney General  
Natural Resources Section  
110 16th Street, 10th Floor  
Denver, CO 80202  
(303) 620-4732

FRD:LG/cal  
8308K:1-5

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☒ Show to whom delivered, date, and addressee's address. (Extra charge) 2. ☐ Restricted Delivery (Extra charge)

|                                                                                                                                                                                                                                                                         |                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| 3. Article Addressed to:<br><b>The Corporation Company</b><br><b>1600 Broadway</b><br><b>Denver, CO 80202</b>                                                                                                                                                           | 4. Article Number<br><b>P 561 501 067</b>               |
| Type of Service:<br><input type="checkbox"/> Registered <input type="checkbox"/> Insured<br><input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD<br><input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise |                                                         |
| Always obtain signature of addressee or agent and <b>DATE DELIVERED</b> .                                                                                                                                                                                               |                                                         |
| 5. Signature — Addressee<br><b>X</b>                                                                                                                                                                                                                                    | 8. Addressee's Address (ONLY if requested and fee paid) |
| 6. Signature — Agent<br><b>X</b> <i>Barbara Sene</i>                                                                                                                                                                                                                    |                                                         |
| 7. Date of Delivery                                                                                                                                                                                                                                                     |                                                         |

PS Form 3811, Apr. 1989 \*U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

LG/cal P 561 501 067

**RECEIPT FOR CERTIFIED MAIL**

NO INSURANCE COVERAGE PROVIDED  
NOT FOR INTERNATIONAL MAIL  
(See Reverse)

PS Form 3800, June 1985 \*U.S.G.P.O. 1989-234-555

|                                                               |    |
|---------------------------------------------------------------|----|
| Sent to<br><b>The Corporation Company</b>                     |    |
| Street and No.<br><b>1600 Broadway</b>                        |    |
| P.O., State and ZIP Code<br><b>Denver, CO 80202</b>           |    |
| Postage                                                       | \$ |
| Certified Fee                                                 |    |
| Special Delivery Fee                                          |    |
| Restricted Delivery Fee                                       |    |
| Return Receipt showing to whom and Date Delivered             |    |
| Return Receipt showing to whom, Date, and Address of Delivery |    |
| TOTAL Postage and Fees                                        | \$ |
| Postmark or Date                                              |    |

**Tim Kelley**

---

**From:** Bill Hickman

**Sent:** Thursday, November 02, 2006 9:36 AM

**To:** Mahesh Albuquerque; Marilyn Hajicek; Tim Kelley; Bev Snodgrass

**Subject:** Suspected Release: 15558 - ROARING FORK TRANSIT AGENCY

During 11/1/06 inspection, 2" of diesel was found in sub-pump containment at diesel UST. Unable to determine source of release at time of inspection. O/O later indicated that there was a possible tank overfill that occurred last week, and possibly some of that product migrated from the tank fill to the STP containment. During the inspection, it was also found that the spill buckets for 3 tanks, including the diesel, are heavily cracked/torn and not liquid tight, so any spillage into the spill bucket as a result of an overfill would not have been contained. O/O was instructed to notify OPS of a suspected release w/in 24 hours, to remove product from containment by 11/2/06, to perform lake test/hydrotest of STP containment, and tightness testing of piping, and report results to OPS w/in 7 days. Other release detection records were requested to be submitted by with the routine inspection.

OVERFILL ON 10/27/06 CONFIRMED BY BILL HICKMAN ✓

//



LOGGED IN 11/3/06 BY 98

NEW ACCESS FACILITY? Y N

## STORAGE TANK REPORT AND RELEASE TRACKING FORM

UST X AST \_\_\_\_\_

COUNTY Garfield

FAC ID# 15558

LETTER REQUIRED YES NO

TECH STAFF BS

LEAK EVENT ID# 10241

SITE NAME Rising Falls Transit Agency

SITE LOCATION 2307 W Wulfschla Rd

SITE CITY STATE & ZIP Galena Wood Springs 81601

OWNER/OPERATOR Rising Falls Transit OID# \_\_\_\_\_

MAILING ADDRESS Same

OWNER CITY STATE & ZIP \_\_\_\_\_

CONTACT PERSON & PHONE NO Russ Decker Cell 970 274-1170

COMMENTS: Alt 970 384-4966

Russ Decker

### VERBAL OR WRITTEN RELEASE INFORMATION

CONTACTED BY Russ Decker

REPORT DATE 11/1/06

PHONE # (970) 384-4966

RELEASE DATE 11/1/06

OPERATING SITE? (Y) N

RELEASE: CONFIRMED (CIRCLE ONE) SUSPECTED

OIL INSPECTOR PRESENT (Y) (N) Bill Hickman

SEND SCR PACKET? Y N

TYPE OF PRODUCT: GASOLINE \_\_\_\_\_ DIESEL X WASTE OIL \_\_\_\_\_ FUEL OIL \_\_\_\_\_ OTHER \_\_\_\_\_

AMOUNT OF RELEASE

~ 3 gallons

SOILS W/PETROLEUM ODORS \_\_\_\_\_

ATG FAILED \_\_\_\_\_

HIGH PID READINGS \_\_\_\_\_

ATG INCONCLUSIVE \_\_\_\_\_

FREE PRODUCT SOIL \_\_\_\_\_

FAILED PTIT \_\_\_\_\_

FREE PRODUCT WATER \_\_\_\_\_

INCONCLUSIVE PTIT \_\_\_\_\_

LAB ANALYSIS SOIL \_\_\_\_\_

FAILED PLTT \_\_\_\_\_

LAB ANALYSIS WATER \_\_\_\_\_

INCONCLUSIVE PLTT \_\_\_\_\_

SIR \_\_\_\_\_

OTHER \_\_\_\_\_

COMMENTS: Fuel Delivery 10/27/06 (oversp. 11)

Mr. Hickman Grounded it today

Being pumped out

10/27/06

### AGENCIES CONTACTED

WQCD \_\_\_\_\_ LOCAL HEALTH DEPT \_\_\_\_\_ FIRE DEPT \_\_\_\_\_ OTR \_\_\_\_\_

\*\*\*\*\*

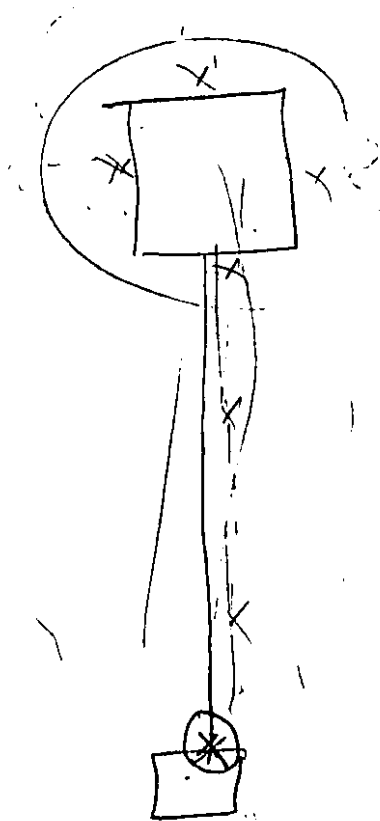
COMMENTS: \_\_\_\_\_

SEND LETTER

TA name \_\_\_\_\_

12/24/06

2/7/07



FACILITY ID#: 15558

ROARING FORK TRANSIT AGENCY

EVENT ID#: 10241

2307 WULFSOHN RD  
GLENWOOD SPRINGS

DATE RECEIVED: 4/30/2007

REPORT TYPE: SCR - Site Characterization Report Received

REVIEWER: Sonnier

SARDONYX ID: USGARROA 5

COMMENTS:

FILE COPY

**WEI**

**Waste Engineering, Inc.**

818 Colorado Avenue, Suite 307, P.O. Box 219  
Glenwood Springs, Colorado 81602  
(970) 945-7755 TEL  
(970) 945-9210 FAX

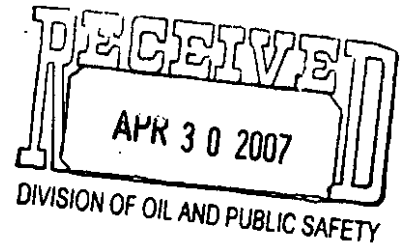
www.wrightwater.com  
e-mail: cheydenberk@wrightwater.com

15558

April 24, 2007

**Via First Class Mail**

Mr. Bobby Sonnier  
Colorado Department of Labor and Employment  
Division of Oil and Public Safety  
Remediation Section  
633 17<sup>th</sup> Street, Suite 500  
Denver, CO 80202-3660



Re: Site Characterization Report for Roaring Fork Transportation Authority  
2307 Wulfsohn Rd Glenwood Springs, CO 81601 Facility ID# 15558

Dear Mr. Sonnier:

Waste Engineering, Inc. (WEI) is submitting the attached Site Characterization Report (SCR). During our conversations, we indicated the data obtained during our investigation was limited. At your request, we obtained grab samples at each of the 10,000-gallon underground storage tank (UST) fill dispensers. The samples were obtained at approximately 1½ feet below ground surface. The samples were analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), diesel range organics (DRO), and gasoline range organics (GRO). Subsequently, the diesel tank sample was analyzed for polyaromatic hydrocarbons (PAHs).

WEI completed this SCR on behalf of Roaring Fork Transportation Authority (RFTA). As indicated during our conversation, due to the limited data collected at the Site, a majority of the information required in the SCR is not available.

Should you have any questions or require additional information, please do not hesitate to call.

Very truly yours,

WASTE ENGINEERING, INC.

By

A handwritten signature in dark ink, appearing to read "DCH", written over a horizontal line.

D. Craig Heydenberk  
Senior Environmental Scientist

C:\\_WORK\WEI\002-040\020mo\Cover letter.doc

DENVER  
(303) 480-1700 TEL (303) 480-1020 FAX

DURANGO  
(970) 259-7411 TEL (970) 259-8758 FAX

# **SITE CHARACTERIZATION REPORT (SCR)**

Submit the completed SCR to:

Colorado Department of Labor and Employment  
Oil Inspection Section  
(Technical Reviewer's Name - if known)  
633 17<sup>th</sup> Street, Suite 500  
Denver, CO 80202-3660

This standardized format is required for all SCRs submitted to the Colorado Oil Inspection Section for releases occurring on or after February 1, 1999.

This SCR is intended to replace the Initial Site Characterization Report (ISCR). In addition to the information formerly included in the ISCR, it is required that the SCR define the extent of contamination. The SCR incorporates risk based corrective actions through Tier 1 or Tier 1A, as appropriate to the site. This report must be submitted in duplicate.

## **IMPORTANT**

**Refer to the OIS Owner/Operator Guidance Document for assistance in report preparation.**

**This report is required to be submitted within 90 days of the release.**

**If contamination has never been detected above Tier 1 and/or MCLs, a No Further Action Request (NFAR) Report may be submitted in place of this SCR.**

**SITE CHARACTERIZATION REPORT****SITE INFORMATION**

|                                                         |                         |                                                  |
|---------------------------------------------------------|-------------------------|--------------------------------------------------|
| <b>Site Name: Roaring Fork Transportation Authority</b> |                         | <b>Type of Business on Site: Bus Maintenance</b> |
| <b>Site Address: 2307 Wulfsohn Road</b>                 |                         |                                                  |
| <b>City: Glenwood Springs</b>                           | <b>County: Garfield</b> | <b>Zip Code: 81623</b>                           |
| <b>Phone Number: (970) 384-4966</b>                     |                         | <b>Fax Number: (970) 928-8273</b>                |
| <b>Site Contact Person: Mr. Russ Decker</b>             |                         |                                                  |

**OWNER/OPERATOR INFORMATION**

|                                                    |                                   |                        |
|----------------------------------------------------|-----------------------------------|------------------------|
| <b>Name: Roaring Fork Transportation Authority</b> |                                   |                        |
| <b>Address: 0051 Service Center Drive</b>          |                                   |                        |
| <b>City: Aspen</b>                                 | <b>State: Colorado</b>            | <b>Zip Code: 81611</b> |
| <b>Phone Number: (970) 384-4966</b>                | <b>Fax Number: (970) 928-8273</b> |                        |
| <b>Contact Person: Mr. Russ Decker</b>             |                                   |                        |

**ENVIRONMENTAL CONSULTANT INFORMATION**

|                                            |                                   |                        |
|--------------------------------------------|-----------------------------------|------------------------|
| <b>Name: Waste Engineering, Inc.</b>       |                                   |                        |
| <b>Address: P. O. Box 219</b>              |                                   |                        |
| <b>City: Glenwood Springs</b>              | <b>State: Colorado</b>            | <b>Zip Code: 81611</b> |
| <b>Phone Number: (970) 945-7755</b>        | <b>Fax Number: (970) 945-9210</b> |                        |
| <b>Contact Person: D. Craig Heydenberk</b> |                                   |                        |

**Date Report was completed: April 24, 2007**

**INSTRUCTIONS FOR COMPLETING REPORT:** Complete all applicable sections and appendices of this report. If a question does not apply to the site, insert ANA=.

Limit your responses to the suggested space(s). If you are using the computer version of this form, the bracketed number after each question (e.g. [2]) is the number of suggested lines for each answer. Do not use bold type when answering, except as requested in the Tables of the Appendices. Insert rows in tables as needed, and delete any unused rows. Contact the Oil Inspection Section technical assistance line at (303) 318-8547 if you have any questions. The OIS Regulations, Guidance Document, Report Formats, and additional program related information can be found at the Oil Inspection Website at <http://oil.cdic.state.co.us>. Call (303) 321-4164 for a copy of the Regulations (commodity # 615-82-44-0899) or the Guidance Document (commodity # 615-82-44-0626).



## SITE CHARACTERIZATION REPORT SUMMARY

What type of product was released? (Check all that apply) Leaded Gasoline \_\_\_ Unleaded Gasoline X Diesel X Waste Oil \_\_\_ Other \_\_\_

Is there evidence of any released hazardous substance on the site? (If this is an AST release and it exceeds the RCRA level for TCLP benzene, it is a hazardous substance.) Yes \_\_\_ No X (check one). If yes, contact the Colorado Department of Public Health and Environment.

Does soil contamination exist? (check all that apply) Onsite X Offsite \_\_\_ If so, what is the vertical extent of soil contamination? From \_\_\_ ft to \_\_\_ ft (unknown). What is the soil type? Pea gravel bedding – Undisturbed soil consists of alluvial silts, clays, and gravels.

Does groundwater contamination exist? (check all that apply) Onsite \_\_\_ Offsite \_\_\_  
The need for a Ground water evaluation has not been determined.

Is free product present in the soil or groundwater? Yes \_\_\_ No \_\_\_ (check one)  
The need for a Ground water evaluation has not been determined.

What is the depth to groundwater (in feet)? Based on the difference in elevation between the Site and Colorado River – The depth to Groundwater is estimated at 300 feet.

**For each category, list the distance from the source to the nearest point of exposure (POE).  
Only list POEs within 1/4 mile of the site.**

|               | Property Boundary | Surficial Soils | Subsurface Utilities | Structures | Groundwater Wells | Surface Water | Sensitive Environment |
|---------------|-------------------|-----------------|----------------------|------------|-------------------|---------------|-----------------------|
| Distance (ft) | 100               | 0               | 50                   | 50         | Unknown           | 800           | 800 Colorado River    |

**List the highest concentration of the following constituents found**

|                            | Benzene | Toluene | Ethyl Benzene | Xylenes | TVPH | TEPH  | TPH | Oil & Grease | Other      |
|----------------------------|---------|---------|---------------|---------|------|-------|-----|--------------|------------|
| Soil (mg/Kg)               | >0.053  | 1.4     | 4.4           | 24      | 580  | 6,600 | N/A | N/A          | YES - PAHs |
| Water (µg/l)               | N/A     | N/A     | N/A           | N/A     | N/A  | N/A   | N/A | N/A          | NO         |
| Vapor (µg/m <sup>3</sup> ) | N/A     | N/A     | N/A           | N/A     | N/A  | N/A   | N/A | N/A          | NO         |

**List the highest concentration of the following constituents remaining on site**

|                            | Benzene | Toluene | Ethyl Benzene | Xylenes | TVPH | TEPH  | TPH | Oil & Grease | Other      |
|----------------------------|---------|---------|---------------|---------|------|-------|-----|--------------|------------|
| Soil (mg/Kg)               | >0.053  | 1.4     | 4.4           | 24      | 580  | 6,600 | N/A | N/A          | YES - PAHs |
| Water (µg/l)               | N/A     | N/A     | N/A           | N/A     | N/A  | N/A   | N/A | N/A          | NO         |
| Vapor (µg/m <sup>3</sup> ) | N/A     | N/A     | N/A           | N/A     | N/A  | N/A   | N/A | N/A          | NO         |

N/A = Not Analyzed

The need for a Groundwater evaluation has not been determined.

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**A. RELEASE INFORMATION****1. History of this release.**

- a) **Date of release (If actual release date is unknown, input the date that the release was first suspected).** [1] February 6, 2007
- b) **Date that OIS was notified of the suspected release.** [1] February 6, 2007
- c) **Date that the suspected release was confirmed.** [1] February 27, 2007
- d) **Date that OIS was notified of the confirmed release.** [1] March 1, 2007
- e) **Include the location of the release on Figure 1, Appendix C.**

**2. How release was discovered.**

- a) **Discovered at tank removal or closure in place (yes/no)** No
- b) **Discovered during subsurface investigation (yes/no)** Yes
- c) **Discovered as a result of release detection or system failure (yes/no)** No
- d) **Impacts discovered at off-site property (yes/no)** No
- a) **Other (describe)** [1] The release was suspected by an OPS Inspector during his observation of replacement of overfill protection. Sampling and analysis of soil samples was requested.

**3. Release description.**

- b) **Product(s) released** [1] Diesel and Gasoline.
- c) **Quantity released** [1] The quantity release is not known but would be limited to quantity released from the original overfill assembly.

**B. SITE HISTORY****1. List known historical uses of the site on the table below.**

| Type of Use and/or Business Name | Begin Date | End Date |
|----------------------------------|------------|----------|
| Bus Maintenance                  | 2002       | current  |
| Previously Undeveloped           |            |          |
|                                  |            |          |

2. Describe any previous releases at the site on the table below. No previous releases are known or have been reported.

| Date of Prior Release | Product | Quantity (gallons) | Source/Cause of Release (Identify location on Fig. 1) | No Further Action Letter Issued? (y/n) (If yes enter date) |
|-----------------------|---------|--------------------|-------------------------------------------------------|------------------------------------------------------------|
| ANA≡                  | ANA≡    | ANA≡               | ANA≡                                                  | ANA≡                                                       |
|                       |         |                    |                                                       |                                                            |

3. If a no further action letter has not been issued for a previous release explain on-going activities [1]. No previous releases are known or have been reported.

### C. RELEASE CONFIRMATION

1. Storage tank removal/closure in place. (Complete Section F-1 to describe tank excavation dimensions, soil laboratory results, etc.).

a) How many tanks were removed or closed in place? [1] No tanks have been removed or closed in place.

b) How many tanks remain on site which are in operation? [1] Two 10,000-gallon tanks remain on site and in operation.

c) How many tanks remain on site which have not been properly closed in place? 0 - Two 10,000-gallon tanks remain on site and in operation.

d) List on the table below information concerning tank removal/closure in place. (Tank # as identified on Figure 1 and/or Figure 2, Appendix C).

| Tank # | Date Removed or Closed | Indicate closed in place(I), removed (R) | Tank Condition (corrosion, holes, etc.) | Contamination Suspected? (y/n) | Samples Analyzed? (y/n) |
|--------|------------------------|------------------------------------------|-----------------------------------------|--------------------------------|-------------------------|
| ANA≡   | ANA≡                   | ANA≡                                     | ANA≡                                    | ANA≡                           | ANA≡                    |
|        |                        |                                          |                                         |                                |                         |
|        |                        |                                          |                                         |                                |                         |

b) Were tank removal or closure in place activities performed in accordance with API recommended practice 1604, or equivalent? (yes/no) No If no, describe tank removal/closure in place activities? [1] No tanks have been removed or closed in place.

2. Subsurface investigation performed prior to a confirmed release, such as for a property transaction, or to confirm release detection or system failure. (Complete Section F-2 to describe soil boring installations, soil laboratory results, etc.). The release was suspected by an OPS Inspector during his observation of the replacement of overfill protection. Sampling and analysis of soil samples was requested.

**a) List on the table below information concerning site investigation.**

| Sample # | Date of Investigation | Contamination Suspected?<br>(y/n) | Samples Analyzed?<br>(y/n) |
|----------|-----------------------|-----------------------------------|----------------------------|
| Diesel   | 2/8/07                | N                                 | Y                          |
| Gasoline | 2/8/07                | N                                 | Y                          |
|          |                       |                                   |                            |

**b) If this investigation was performed as the result of release detection or system failure what part of the UST system failed? [1] No - The release was suspected by OPS Inspector during replacement of overfill protection. Sampling and analysis of soil samples was requested.**

- i. Was the system repaired? (yes/no)** The overfill protection assembly will be replaced.
- ii. Date of repair. [1]** On hold. Until OPS reviews this SCR.

**D. SITE CLASSIFICATION AND INITIAL RESPONSE/ABATEMENT**

**1. Site Classification Table.** A site characterization has not been completed. As a result the site classification tables can not be completed.

**a) Complete the Site Classification Table presented in Appendix G. See D.1**

**b) What is the current site classification? (1, 2, 2a, 3, 4)** Unknown.

**c) Has the site classification changed since the submittal of the Site Summary Form (SSF)? (As the extent of contamination is defined at the time of this report, the Site Classification Table will no longer contain unknown (U) threats). A site summary form was not requested by the OPS.**

**d) What classification was indicated for the site on the SSF? (1, 2, 2a, 3, 4)** See D.1

**2. Initial response and abatement. (Did the site classification ever indicate the need for an emergency response? (yes/no) No (If yes, answer the following questions and include all supporting documentation such as required permits in Appendix H, and waste manifests in Appendix F.)**

**a) Was the presence of explosive vapors ever detected at the site? (yes/no)** Explosive vapors were not noticeable during the sampling.

- i. If yes what actions were taken to mitigate explosion risks? [2]** See 2.a
- ii. Have these actions been completed?** ANA≡

**b) Was the presence of vapors or surficial particulates, in concentrations which may cause acute health effects, ever detected at the site?** ANA≡

- i. If yes, what actions were taken to mitigate the acute health risks?**
- ii. Have these actions been completed?** ANA≡

c) **Was the presence of free product on the ground surface, surface water, exposed soils, or in utilities ever detected at the site?** Regarding ground surface and exposed soil – No. No surface water was observed. The need for a utility investigation has not been determined.

i. **If yes, what actions were taken to mitigate these conditions?** [2] ANA≡

ii. **Have these actions been completed?** (yes/no) ANA≡

d) **Was any water supply well, supply line, storm water, or surface water body ever impacted by the release?** (yes/no) The site is connected to city water. Supply lines have not been evaluated. Stormwater was not observed during the site investigation. Given the estimated distance to the Colorado River (800'), it is unlikely that the Colorado River has been impacted.

i. **If yes what actions were taken to mitigate the risk of exposure to these Points of Exposure (POEs)?** [2] ANA≡

ii. **Have these actions been completed?** (yes/no) ANA≡

e) **Are there any other site classification sub-classifications, which relate to potential emergency situations, as listed above (e.g., Sub-classification 2.1 - Explosive vapors may accumulate in buildings within six months) currently applicable to this site?** (yes/no) A site characterization has not been completed. As a result the site classification or sub-classification tables can not be completed at this time.

i. **If yes, are activities underway or completed to mitigate these threats?** [2] ANA≡

ii. **Will mitigation activities be included in the corrective action plan (CAP)?** (yes/no) A CAP for this release has not been requested by the OPS.

## **E. FREE PRODUCT**

1. **Complete this section if free product has been discovered in wells, borings, or excavations.** A site characterization involving wells and borings has not been completed. A site characterization involving wells and borings has not been completed. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

2. **Free Product in Wells or Borings** See E.1

a) **Provide information regarding free product located in wells or borings in Tables 4 and 5, Appendix B.**

b) **On what date was free product discovered?** [1] A site characterization involving wells and borings has not been completed. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

c) **On what date was the OIS notified of the presence of free product?** [1] A site characterization involving wells and borings has not been completed. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

d) **Has free product been recovered?** (yes/no) No



e) If so, what was the recovery method? [2] ANA≡

f) What was the quantity recovered? [1] ANA≡

g) How was recovered free product disposed? [1] ANA≡

### 3. Free Product in Excavations

a) Provide information regarding free product discovered in excavations.

| Date Discovered | Location | Product Thickness | Recovery Method | Date Recovery Completed | Quantity Recovered |
|-----------------|----------|-------------------|-----------------|-------------------------|--------------------|
| ANA≡            | ANA≡     | ANA≡              | ANA≡            | ANA≡                    | ANA≡               |
|                 |          |                   |                 |                         |                    |
|                 |          |                   |                 |                         |                    |

Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

b) On what date was the OIS notified of the presence of free product? [1] ANA≡

c) How was recovered free product disposed? [1] ANA≡

## F. SOIL INVESTIGATION

### 1. Excavations. (Includes excavations, trenches and construction excavations.)

a) Excavation dimensions.

i. Complete the following table for each excavation.

Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

| Excavation # | Length of Excavation | Width of Excavation | Depth of Excavation | Depth to Groundwater in Excavation (if present) |
|--------------|----------------------|---------------------|---------------------|-------------------------------------------------|
| Diesel       | 4 feet               | 5 feet              | 1.5 feet            | Not Present to 1.5                              |
| Gasoline     | 5 feet               | 9 feet              | 1.5 feet            | Not Present to 1.5                              |
|              |                      |                     |                     |                                                 |

ii. Plot the location of each excavation (include excavation #) on Figure 2, Appendix C.

b) Excavation Organic Vapor Meter (OVM) screening measurements.

i. List all OVM measurements on Table 1, Appendix B.

ii. Indicate the locations of OVM measurements (which did not have a laboratory analysis performed at the same location) on Figure 2a, Appendix C.

**c) Excavation Soil Sampling.**

- i. List all soil laboratory results on Table 2, Appendix B. Identify the locations where samples were obtained on Figure 2, Appendix C.
- ii. List the rationale for the sampling locations on Table 2, Appendix B.
- iii. Present geological observations including lithology in section J.
- iv. Were soils samples collected according to procedures filed with the OIS as part of the Listed Consultant program? Yes According to the OIS Owner/Operator Guidance Document? No If neither, describe soil sampling collection procedures. [3] Only one sample was requested by the OPS for each tank obtained near the original spill/overflow protection device.

**d) Soil Disposition**

- i. Complete the following table if any soils were excavated.

| Excavation Number | Cubic Yards of Contaminated* Soil Excavated | Disposition of Contaminated* Soil | Cubic Yards of Clean Soil Excavated | Disposition of Clean Soil |
|-------------------|---------------------------------------------|-----------------------------------|-------------------------------------|---------------------------|
| Diesel            | 0                                           | 0                                 | 0                                   | 0                         |
| Gasoline          | 0                                           | 0                                 | 0                                   | 0                         |
|                   |                                             |                                   |                                     |                           |

\* Soil concentrations above Tier 1 RBSLs and 500 mg/kg TPH.

- ii. Attach waste disposal manifests in Appendix F. No soil disposal has occurred.
- e) If groundwater was detected in the excavation complete Section H.
- f) Was extent defined to Tier 1 RBSLs and to the TPH threshold level of 500 mg/Kg? No If no, why not? [2] A Site characterization has not been requested by the OPS.
2. Soil Borings/Direct Push Points Soil sampling involving Borings/Direct Push Points has not been performed at the Site or Requested by the OPS.

**a) Borehole/direct push OVM screening.**

- i. Include the OVM screening measurements on the boring logs (Appendix E) for samples screened during the boring installations.
- ii. Indicate the locations of the borings (which did not have laboratory analyses of soil collected from the boring) on Figure 3a, Appendix C.

**b) Soil Sampling in the borehole/direct push points See 2.0**

- i. List all soil laboratory results on Table 2, Appendix B. Present boring locations on Figure 3, Appendix C.
- ii. List the rationale for the sampling locations on Table 2, Appendix B.
- iii. Present geological observations including lithology on the boring logs (Appendix E) and in section J.

- iv. Were soils samples collected according to procedures filed with the OIS as part of the Listed Consultant program? ANA≡ According to the OIS Owner/Operator Guidance Document? ANA≡ If neither, describe soil sampling collection procedures. [3]

**c) Soil Disposition**

- i. Were any contaminated soils generated during borehole installation activities? ANA≡ If yes, how were they disposed? [1] ANA≡
- ii. If any contaminated soils were disposed, attach waste disposal manifests in Appendix F.

- d) Was the extent of soil contamination defined to Tier 1 RBSLs and to the TPH threshold value of 500mg/Kg? No If no, why not? [2] A site characterization has not been performed or requested by the OPS.

**G. SOIL VAPOR INVESTIGATION**

1. Was the purpose of soil vapor sample collection to assist in defining the extent of petroleum hydrocarbon contamination in the subsurface? A soil vapor investigation has not been performed or requested by the OPS.
2. Was the purpose of soil vapor sample collection to identify threats to structures that may be impacted from soil vapors? ANA≡ If yes briefly describe rationale for selected locations and depths (e.g., proximity to source, soil types, utilities, etc.) [3]
3. How many samples were collected from each point? [1] ANA≡
4. Show the location of each sampling point on Figure 4, Appendix C. List sample results, sample location rationale, and depths on Table 3, Appendix B. ANA≡
5. What was the vapor point installation method? [2] ANA≡
6. What was the method of sample collection? [2] ANA≡
7. Were vapor samples collected according to procedures filed with the OIS as part of the Listed Consultant program? ANA≡ According to the OIS Owner/Operator Guidance Document? ANA≡ If neither, describe vapor sampling collection procedures. [3] ANA≡

**H. GROUNDWATER INVESTIGATION**

1. Were monitoring wells installed, and groundwater sampled? No – A groundwater investigation has not been performed or requested by the OPS.
  - a) What is the average depth to groundwater at the site? ANA≡
  - b) For each monitoring well completed at the site list information regarding surveyed elevation of the measuring point, depth to groundwater, depth to product and

**groundwater elevation on Table 5, Appendix B. Present the locations of the monitoring wells, including groundwater elevation values on Figure 6, Appendix C.**

- c) List all groundwater laboratory results on Table 4, Appendix B. Present monitoring well locations on Figure 5, Appendix C.**
- 2. Was groundwater discovered in locations other than wells (e.g., tank excavations)? A groundwater investigation has not been performed or requested by the OPS**
- a) At what locations (other than in wells) was groundwater discovered? [2] ANA≡**
- b) Identify the locations where groundwater was discovered (other than in wells) on Figure 5, Appendix C or on Figure 2, Appendix C, as appropriate. If groundwater at these locations was sampled, provide the sample results on Table 4, Appendix B. If groundwater was not sampled at these locations, explain why not [2] ANA≡**
- c) If excavation dewatering was necessary, provide volume data, manifests, discharge permits, and compliance sampling results in Appendix H.**
- 3. Were groundwater samples collected according to procedures filed with the OIS as part of the Listed Consultant program? (yes/no) ANA≡ According to the OIS Owner/Operator Guidance Document? (yes/no) ANA≡ If neither, describe groundwater sample collection procedures. [3] A groundwater investigation has not been performed or requested by the OPS.**
- 4. Has the extent of groundwater contamination been defined to concentrations below the MCLs? (yes/no) No If no, why not? [2] A groundwater investigation has not been performed or requested but the OPS.**

## **I. QUALITY ASSURANCE/QUALITY CONTROL**

### **1. Sampling Handling**

- a) Was all decontamination performed during this investigation in accordance with the QA/QC filed with the OIS as part of Listed Consultant program? Yes**
- b) Was all decontamination performed during this investigation in accordance with the QA/QC as described in Owner/Operator guidance document? Yes**

c) If the answer to both of the above is no, complete the following table.

| Equipment | Decontamination Method |
|-----------|------------------------|
| ANA≡      | ANA≡                   |
|           |                        |
|           |                        |

2. Provide all information regarding sample handling and shipping as instructed in Appendix D.

## J. GEOLOGY AND HYDROGEOLOGY

1. Regional Geology -within ½ mile (This information is required if minimal site specific data is available. If the site geology has been characterized, regional data should only be obtained, as necessary, to supplement site specific data).

a) What is the lithology and stratigraphy of the unsaturated and uppermost saturated intervals? [2] Surficial geology consists of unconsolidated alluvial materials. The alluvium includes sands, silts, and gravels.

b) Describe any features that may affect regional groundwater flow. [2] The Site is located approximately 800 feet south of the Colorado River.

c) What is the source of the information listed above? [1] Site observation and knowledge of area.

2. Site Geology (Using the data collected during excavation activities and the drilling logs located in Appendix E answer the following questions. If complex geology exists at the site, which a cross-section would help to illustrate, include it in Appendix E with the borings logs). ANA≡

a) What is the lithology and stratigraphy of the unsaturated and uppermost saturated intervals? [2] Unknown

b) Describe any features at the site which could affect groundwater flow such as the slope of the uppermost bedrock unit [2] Unknown

3. Regional Hydrogeology (within ½ mile) (This information is required if groundwater was not encountered during the site characterization. If groundwater was encountered, regional data should only be obtained, as necessary, to supplement site specific data).

Based on the difference in elevation between the Site and Colorado River – The depth to Groundwater is estimated at 300 feet.

a) What is the average depth to groundwater? [1] Unknown

b) What is the average thickness of the uppermost saturated interval? [1] Unknown

c) What is the regional groundwater flow direction? [1] Unknown

- d) **Is there evidence that the flow direction may vary?** [1] Unknown
- e) **What is the source of the information?** [1] ANA≡
4. **Site Hydrogeology** A groundwater investigation has not been performed or requested by the OPS.
- a) **What is the average depth to groundwater?** [1] Unknown
- b) **What is the average thickness of the uppermost saturated interval?** [1] Unknown
- c) **What is the groundwater flow direction?** [1] Based on topography Groundwater Flow Direction is expected to be to the North.
- i. **If there is evidence that flow direction varies, include groundwater elevation maps indicating the varying flow directions (Figure 6, Appendix C).** Unknown
- ii. **What is the suspected or known reason for this variation?** [2] ANA≡
- iii. **What is the most prevalent flow direction?** [1] Based on topography the most prevalent flow direction is to the North.
- d) **Complete the following table of aquifer parameters.**

| Parameter                 | Value   | How Was This Value Estimated? (Include Identification Numbers of Wells Tested) |
|---------------------------|---------|--------------------------------------------------------------------------------|
| Hydraulic Gradient        | Unknown | Unknown                                                                        |
| Effective Porosity*       | Unknown | Unknown                                                                        |
| Hydraulic Conductivity*   | Unknown | Unknown                                                                        |
| Groundwater Flow Velocity | Unknown | Unknown                                                                        |

\*May be estimated based on soil types during Tier 1 only

## K. POINTS OF EXPOSURE

1. **Property Boundary** A Site Investigation involving the evaluation of the extent and degree of contamination has not been performed or requested by the OPS.
- a) **What is the distance from the source of contamination to the nearest downgradient property boundary?** [1] It is estimated at 200 feet.
- b) **Provide the location of all site property boundaries on Figure 7, Appendix C.**
2. **Surficial Soils**
- a) **Is there reason to suspect that persons will come into contact with surficial soils containing contaminant concentrations not protective of exposure through dermal contact, inhalation, or ingestion?** No
- b) **If yes, what is the distance from the source to the nearest surficial soils that persons may come into contact with?** ANA≡



- c) Indicate the location of all impacted surficial soils that persons may come into contact with on Figure 7, Appendix C.

### 3. Utilities

- a) Are there utilities that could potentially be impacted by the release? (yes/no) Yes

- b) Complete the information concerning all utilities both on-site and off-site on the table below and provide utility locations on Figure 7, Appendix C.

| Utility               | Depth to Water | Depth to Utility | Impacted (y/n) | Potential to be Impacted (y/n) |
|-----------------------|----------------|------------------|----------------|--------------------------------|
| Natural Gas Line      | Unknown        | 4'               | Unknown        | y                              |
| Water Line            | Unknown        | 8'               | Unknown        | y                              |
| Sanitary Sewer Line   | Unknown        | 8'               | Unknown        | y                              |
| Storm Sewer Line      | Unknown        | 8'               | Unknown        | y                              |
| Subsurface Power Line | Unknown        | 4'               | Unknown        | y                              |
| Communication Conduit | Unknown        | 4'               | Unknown        | y                              |
| Other (None)          | -              | -                | Unknown        | y                              |

- c) What is the distance from the source to the nearest impacted or potentially impacted utility? Approximately 30' to the North.

### 4. Structures (excludes structures that house a business which dispenses petroleum products as part of normal operations). A Site Investigation involving the evaluation of the extent and degree of contamination has not been performed or requested by the OPS.

- a) Are there structures that have been impacted by vapor migration from contaminated groundwater or soils? The occurrence of vapor migration was not noticed during or Site investigation or reported by onsite personnel.

- b) Are there structures that have the potential to be impacted by vapor migration from contaminated groundwater or soils? (yes/no) The occurrence of vapor migration was not noticed during or Site investigation or reported by onsite personnel.

- c) Present all structures, including those that have been impacted or have the potential to be impacted by vapor migration from either contaminated groundwater or soil on Figure 7, Appendix C.

- d) What is the distance from the source to the nearest structure that has been impacted or has the potential to be impacted by vapor migration from contaminated groundwater or soils [1]. 50 feet.

**5. Groundwater Wells (excluding monitoring wells)** A groundwater well search has not been performed or requested by the OPS.

a) List the location and uses of all groundwater wells located within ½ mile of the site. Include this information on Table 6, Appendix B. Present the location of the wells on a U.S.G.S. 7.5' Quadrangle Topographic map (Figure 8, Appendix C).

b) How many groundwater wells are located downgradient and within ½ mile of the site? [1] Unknown

c) Is there a producing groundwater well whose radius of influence could affect groundwater flow at the site? (yes/no) Unknown

d) What is the distance from the source to the nearest downgradient groundwater well? [1] Unknown

**6. Surface Water/Sensitive Environments**

a) Identify the location of all surface water features (lakes, streams, wetlands, etc.) located within ½ mile of the site on Figure 8, Appendix C.

b) What is the distance from the source to the nearest downgradient surface water feature? [1] The Colorado River is located approximately 800 feet North of the Site.

**L. EXPOSURE PATHWAYS**

An evaluation of the extent and degree Characterization has not been performed or requested by the OPS. As a result, The Exposure Pathway Screening Criteria Table cannot be completed.

**a) Complete the Exposure Pathway Screening Criteria Table**

| <b>Exposure Pathway Screening Criteria - Bases for Eliminating Pathways</b>                                                                                                                                                                                                                                                                                                                                           | <b>Y</b> | <b>N</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|
| <b>Groundwater (Ingestion):</b>                                                                                                                                                                                                                                                                                                                                                                                       |          |          |
| --Impacted groundwater concentrations are below MCLs, or                                                                                                                                                                                                                                                                                                                                                              |          |          |
| --Impacted water-bearing unit is designated as "non-usable" by the CWQCC, or                                                                                                                                                                                                                                                                                                                                          |          |          |
| --Groundwater plume is stable or diminishing within the property boundary (as demonstrated by four quarters of monitoring), and<br>--There is no impact to a water supply well, (active or inactive), and<br>--Dissolved oxygen concentrations are higher outside of the defined plume, and<br>--Groundwater flow velocity is <50 ft/year, and<br>--Transport modeling results are consistent with site observations. |          |          |
| <b>Groundwater (Enclosed Space Vapors):</b>                                                                                                                                                                                                                                                                                                                                                                           |          |          |
| --Impacted groundwater concentrations are below MCLs, or                                                                                                                                                                                                                                                                                                                                                              |          |          |
| --No existing structure is within the influence of the contamination, or                                                                                                                                                                                                                                                                                                                                              |          |          |
| --There is an existing structure within the influence of the contamination, and the structure houses a business which dispenses petroleum products as part of its operation.                                                                                                                                                                                                                                          |          |          |
| <b>Surficial Soils (Ingestion, Ambient Vapors, Particulates, Dermal Contact):</b>                                                                                                                                                                                                                                                                                                                                     |          |          |
| --Impacted soils concentrations below Tier 1 limits, or                                                                                                                                                                                                                                                                                                                                                               |          |          |
| --Impacted soils have been removed from the site.                                                                                                                                                                                                                                                                                                                                                                     |          |          |
| <b>Subsurface Soils (Enclosed Space Vapors):</b>                                                                                                                                                                                                                                                                                                                                                                      |          |          |
| --Impacted soils are below Tier 1 limits, or                                                                                                                                                                                                                                                                                                                                                                          |          |          |
| --No existing structure is within the influence of the contamination.                                                                                                                                                                                                                                                                                                                                                 |          |          |
| --There is an existing structure within the influence of the contamination, and the structure houses a business which dispenses petroleum products as part of its operation.                                                                                                                                                                                                                                          |          |          |
| <b>Subsurface Soils (Leaching to Groundwater):</b>                                                                                                                                                                                                                                                                                                                                                                    |          |          |
| --Impacted soils are below Tier 1 limits.                                                                                                                                                                                                                                                                                                                                                                             |          |          |

- b) Do the responses to the Exposure Pathway Screening Criteria Table indicate that any pathways may be eliminated from further consideration? (yes/no) Unknown**
- c) Are there any conditions not included in the table that may result in the elimination of any additional pathways? (yes/no) Unknown**
- d) If so, identify the pathway and conditions here. Any pathway elimination not specified in the table is subject to OIS approval. [4] ANA≡**
- e) For all pathways that may be eliminated, attach any supporting documentation (e.g., documentation of a "non-useable" designation by the CWQCC) in Appendix H.**

**f) What are the completed exposure pathways? See L.**

- i. Groundwater (Ingestion) (yes/no)**
- ii. Groundwater (Enclosed Space Vapors) (yes/no)**
- iii. Surficial Soils (Ingestion, Ambient Vapors, Particulates, Dermal Contact) (yes/no)**
- iv. Subsurface Soils (Enclosed Space Vapors) (yes/no)**
- v. Subsurface Soils (Leaching to Groundwater) (yes/no)**

**M. LAND USE**

- 1. All sites are considered under the residential land use classification unless the industrial classification is requested and approved by the OIS. Is an industrial classification being requested for this site? (yes/no) An Industrial land use may be appropriate.**
  - a) If yes, is the property and any currently or potentially impacted property currently zoned Industrial? (yes/no) The Site and surrounding property is zoned light industrial.**
  - b) If yes, has the OIS been added to the list of parties to be notified of any application for rezoning? (yes/no) No**
  - c) If yes, include official documentation of the addition of the OIS to this list (this documentation must indicate that the OIS will remain on the list until the OIS requests to be removed from the list). Include this documentation in Appendix H.**

**N. RISK BASED SCREENING LEVEL (RBSL) SELECTION**

A Site Characterization involving the evaluation of the extent and degree of soil contamination has not been performed or requested by the OPS.

1. Complete the following table to determine the appropriate RBSL(s) for the site. Refer to the OIS Storage Tank Regulations (7 C.C.R. 1101-14, Table 5-1) for the Tier 1 RBSL look-up table. If a "y" has been indicated in the Pathway Completed column, the RBSL and Source Concentration columns should be completed for every COC that exceeds the Tier 1 RBSL in Table 5-1. Consider the Land Use designation for the site to determine the correct RBSL for each completed pathway.

| Exposure Pathway                              | Pathway Completed (y/n) | Chemical of Concern (COC) | RBSL | Source Concentration |
|-----------------------------------------------|-------------------------|---------------------------|------|----------------------|
| Surficial Soil (mg/Kg)                        |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |
| Soil Leaching to groundwater (mg/Kg)          |                         | Benzene                   | 0.26 | > .053               |
|                                               |                         | Toluene                   | 140  | 1.4                  |
|                                               |                         | Ethylbenzene              | 190  | 4.4                  |
|                                               |                         | Xylene                    | 260  | 24                   |
| Soil Vapor to Indoor Air (ug/m <sup>3</sup> ) |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |
| Groundwater to Indoor air inhalation (mg/l)   |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |
| Groundwater Ingestion (mg/l)                  |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |

2. RBSLs per media

- a) Were both the Surficial Soil and Soil Leaching to Groundwater exposure pathways complete? (yes/no) If yes, the RBSLs for soil will be those for the Soil Leaching to Groundwater exposure pathway. Unknown
- b) Were both the Groundwater to Indoor Air Inhalation and Groundwater Ingestion pathways complete? (yes/no) If yes, the RBSLs for groundwater will be those for the Groundwater Ingestion exposure pathway. Unknown

**O. TOTAL PETROLEUM HYDROCARBONS (TPH)/POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)**

A Site investigation involving the evaluation of the extent and degree of soil contamination has not been performed or requested by the OPS.

**1. Source concentrations**

- a) Are all of the concentrations of the chemicals of concern (benzene, toluene, ethylbenzene, xylenes) associated with this release below the RBSLs or SS-RBSLs? (yes/no) Based upon the two soil samples collected at the Site, RBSLs for BTEX have not been exceeded.
- b) Does the TPH concentration exceed the threshold value of 500 mg/Kg? Yes, both samples had reported DRO and GRO concentrations above 500 mg/Kg.

**2. PAH Evaluation - If both answers to question #1 above are yes, then a soil sample collected from the area believed to be the most contaminated must be analyzed for the 16 priority PAHs. For the following questions refer to the Tier 1 RBSL table for PAHs in the Owner/Operator Guidance Document.**

**a) If the surficial soil pathway is complete at this site answer the following questions:**

- i. Do site PAH concentrations exceed the Tier 1 RBSLs for any compounds for the surficial soil pathway? PAH concentrations for the Diesel do not exceed Tier I RBSL's. PAH analysis for Gasoline was not requested by the OPS.
- ii. If yes, list the compounds that exceed the RBSLs and the concentrations at which they remain on the site. ANA=

**b) If the subsurface soil leaching to groundwater pathway is complete at this site answer the following questions:**

- i. Do site PAH concentrations exceed the Tier 1 RBSLs for benz(a)-anthracene, dibenz(a,H)-anthracene or naphthalene compounds for the subsurface soil leaching to groundwater pathway? PAH concentrations for Diesel do not exceed the Tier 1 RBSLs. PAH analysis for Gasoline was not requested by the OPS.
- ii. If yes, list the compounds at the site that exceed the RBSLs for the above compounds and the concentrations at which they remain on the site.
- iii. Do PAH levels exceed the Tier 1 RBSLs for the 13 chemicals not specified in "i" above for the surficial soil pathway? (yes/no) PAH concentrations for Diesel do not exceed the Tier 1 PAH RBSLs. PAH analysis for Gasoline was not requested by the OPS.
- iv. If yes, list the compounds at the site that exceed the RBSLs for the above compounds and the concentrations at which they remain on the site. See O.2.b.iii.

**c) If the groundwater volatilizing to indoor air pathway is complete at this site answer the following questions: A Groundwater investigation has not been performed or requested by the OPS.**



- i. Do site naphthalene concentrations exceed the Tier 1 RBSL for the groundwater volatilizing to indoor air pathway? (yes/no) Unknown
- ii. If yes, what is the concentration of naphthalene in groundwater remaining on the site? ANA≡

d) If the groundwater ingestion pathway is complete at this site answer the following questions: See O.2.c

- i. Do site benzo(a)-pyrene concentrations exceed the Tier 1 RBSL for the groundwater ingestion pathway? (yes/no) Unknown
- ii. If yes, what is the concentration of benzo(a)-pyrene in groundwater remaining on the site? Unknown

**P. TIER 1A**

- 1. Has a Tier 1A evaluation been performed for this site? (yes/no) No
- 2. Was there reason to believe, based on site conditions, that the collection of site-specific information would lead to a significantly different cleanup goal? (yes/no) Unknown
- 3. Were site-specific data collected to be used as input parameters into the Tier 1A Model? (For a Tier 1A evaluation, site-specific data must be collected from the site, or calculated from data collected from the site, as outlined in the Owner/Operator Guidance Document.) (yes/no) No

4. If site-specific input parameters were used to create Tier 1A SS-RBSLs, list those parameters on the following table and indicate the source of the data. Include locations where data are collected on the appropriate figure. A site characterization has not been performed or requested by the OPS.

| Parameter                         | Value | How Was This Value Determined? (Include Identification Numbers of Wells Tested, Location of Borings, etc.) |
|-----------------------------------|-------|------------------------------------------------------------------------------------------------------------|
| Depth to subsurface soil source   |       | Unknown                                                                                                    |
| Depth to groundwater              |       | Unknown                                                                                                    |
| Thickness of the capillary fringe |       | Unknown                                                                                                    |
| Thickness of the unsaturated zone |       | Unknown                                                                                                    |
| Length of source                  |       | Unknown                                                                                                    |
| Width of source                   |       | Unknown                                                                                                    |
| Hydraulic conductivity            |       | Unknown                                                                                                    |
| Gradient                          |       | Unknown                                                                                                    |
| Fraction of organic carbon        |       | Unknown                                                                                                    |
| Total porosity                    |       | Unknown                                                                                                    |
| Unsaturated zone water content    |       | Unknown                                                                                                    |
| Unsaturated zone air content      |       | Unknown                                                                                                    |
| Infiltration rate                 |       | Unknown                                                                                                    |
| Soil bulk density                 |       | Unknown                                                                                                    |
| Distance to point of exposure     |       | Unknown                                                                                                    |
| Effective porosity                |       | Unknown                                                                                                    |

5. Attach the Tier 1A SS-RBSL table generated by inputting site specific data collected above into the Tier 1A Model (located on the OIS webpage)

#### Q. RECOMMENDATIONS

- Are all source concentrations remaining at the site below RBSLs in soil and MCLs in groundwater? (yes/no) Unknown If yes, you may request no further action. A groundwater investigation has not been performed or requested by the OPS.
- Are source concentrations remaining at the site above RBSLs in soil and/or MCLs in groundwater? (yes/no) An investigation involving evaluation of the extent a degree of soil contamination or groundwater evaluation has not been performed or requested by the OPS. If yes, do you recommend remediation to Tier 1 levels? (yes/no) Unknown What method(s) of remediation will you be evaluating in your corrective action plan (CAP)? [2] Unknown
- Have you performed a Tier 1A evaluation? (yes/no) No Are all source concentrations remaining at the site below the SS-RBSLs generated in the Tier 1A evaluation? (yes/no) Unknown  
If yes, you may request a no further action.

4. **Have you performed a Tier 1A evaluation? (yes/no) No Are source concentrations remaining at the site above the SS-RBSLs generated in the Tier 1A evaluation? (yes/no) Unknown If yes, do you recommend remediation to Tier 1A levels, or Tier 1 levels? (yes/no) Unknown What method(s) of remediation will you be evaluating in your CAP?[2] Unknown**
5. **Have you performed a Tier 1A evaluation? (yes/no) No Are source concentrations remaining at the site above the SS-RBSLs generated in the Tier 1A evaluation? (yes/no) Unknown If yes, do you recommend proceeding to a Tier 2 evaluation? (yes/no) Unknown What method(s) of remediation will you be evaluating in your CAP to cleanup to Tier 2 should site specific target levels be exceeded? [2] Unknown**

## APPENDIX A - INSTRUCTIONS

### 1. TABLES (Appendix B)

#### Table 1 - Summary of Organic Vapor Meter Readings

This table lists the results of field screening of soil samples with an Organic Vapor Meter (OVM). Information presented shall include sample location, OVM reading, sample depth (ft bgs), and an indication of whether the sample was analyzed at a laboratory.

#### Table 2 - Summary of Soil Laboratory Results

This table lists the results obtained from laboratory testing of soil samples. Information presented shall include sample designation, sample collection date, sample depth (ft bgs), and analyte concentrations. If any analyte was detected which is not listed on this table, answer Ayes in the AOther column and attach the laboratory analytical reports for those analytes. Concentrations that exceed the Tier 1 RBSL for the soil leaching to groundwater pathway must be entered in bold type face. Also include on Table 2 the rationale for sample collection, using the codes listed in the footnote.

TVPH = Total Volatile Petroleum Hydrocarbons

TEPH = Total Extractable Petroleum Hydrocarbons

TPH = Total Petroleum Hydrocarbons

#### Table 2a - Summary of PAH Soil Laboratory Results

If a sample was analyzed for the priority PAHs the results obtained from the laboratory testing should be listed on this table. Information presented shall include sample designation, sample collection date, sample depth (ft bgs), and analyte concentrations in mg/Kg. This analysis will only be required when the BTEX constituents are below site cleanup goals and TPH concentrations exceed 500mg/Kg.

**Table 3 - Summary of Vapor Laboratory Results**

This table lists the results obtained from laboratory testing of vapor samples. Information presented shall include sample designation, sample collection date, sample depth (ft bgs), and analyte concentrations. If any analyte was detected which is not listed on this table, answer Ayes in the AOther column and attach the laboratory analytical reports for those analytes. Also included on this table is the rationale for sample collection.

**Table 4 - Summary of Groundwater Laboratory Results**

This table must be included when water samples are collected and shall present the results obtained from laboratory testing of water samples. Information presented shall include sample designation, sample collection date, sample depth (depth below grade level when collected from an excavation), analyte concentrations, and analytical methods. If any analyte was detected which is not listed on this table, answer Ayes in the AOther column and attach the laboratory analytical reports for those analytes. Concentrations that exceed Colorado groundwater standards (MCLs) shall be presented in boldface type. Sample locations must be illustrated on Figure 5.

**Table 5 - Groundwater Elevation Table**

This table shall include the surveyed elevation of each well measured during this investigation, the date of the measurement, depth to water, depth to product, product thickness, product elevation, and the corrected elevation of the groundwater.

**Table 6 - Summary of Water Well Information**

This table shall include the results of a water well survey for wells located within 2 mile of the site. Information presented shall include the well number, geographic location (cadastral coordinates), approximate distance from site (if known), approximate compass direction from site (if known), use of each well, well depth, water level, and pumping rate. Wells down gradient of the site shall be presented in boldface type.

**2. FIGURES (Appendix C)**

Requirements common to all maps include the following: title block with figure number, site name, site address, date, scale, north arrow, and a legend. Distinct symbols should be used to differentiate varying sampling and analytical techniques (e.g.  $\odot$  = Monitoring Well,  $\bullet$  = Borehole,  $\circ$  = Geoprobe Point,  $\square$  = OVM locations,  $\Phi$  = laboratory data). All maps must be created to scale.

**Figure 1 - Site Map**

This map shall illustrate the important features at the site and the area immediately adjacent to the site. Include locations of property boundaries, fences, streets (with names), site buildings and adjacent structures, USTs/ASTs, piping runs and dispensers, and type of ground cover.

**Figure 2 - Excavation Sample Location Map**

This map shall illustrate the former locations of the tanks, and the sampling locations from within each tank excavation. For each of these sampling locations include a text box with sample depth and laboratory analytical results. Also include on the map the location of soils stockpiled. Clearly identify the dimensions of the excavation areas. Include features from Figure 1 as necessary for reference (e.g., major structures).

Diesel ex 4x5

Gas ex 5x9

**Figure 2a – OVM Screening Locations**

The two soil samples obtained at the Site were not screened using an OVM.

This map shall illustrate locations of samples collected for soil screening (as indicated in Table 2), which were not submitted to the laboratory for analysis. Include features from Figure 1 as necessary for reference (e.g., major structures, excavations, etc.). If the screened soils were submitted for analysis the location of the sample should not be identified on this figure, but should be placed on either Figure 2 or 3.

**Figure 3 - Soil Sample Location Map**

This map shall illustrate the sampling locations at the site (outside of the tank excavation(s)). Include features from Figure 1 as necessary for reference (e.g., major structures, excavations, etc.) For each of these sampling locations include a text box with sample depth and laboratory analytical results.

**Figure 4 - Vapor Sample Location Map**

A site investigation involving vapor sampling has not been performed or requested by the OPS.

This map shall illustrate the sampling locations at the site. Include features from Figure 1 as necessary for reference (e.g. major structures, excavations, etc.). For each of these sampling locations include a text box with sample depth and laboratory analytical results.

**Figure 5 - Groundwater Sample Location Map**

A site investigation involving a groundwater evaluation has not been performed or requested by the OPS.

This map shall illustrate the groundwater sampling locations at the site. Include features from Figure 1 as necessary for reference (e.g., major structures, excavations, etc.). For each of these sampling locations include a text box with laboratory analytical results.

**Figure 6 - Groundwater Elevation Map**

A site investigation involving a groundwater evaluation has not been performed or requested by the OPS.

This map shall illustrate the locations at which groundwater levels have been measured. Figure 1 may be used as a base map. Include the date of the measurement (separate maps must be created for individual measuring events) and the relative groundwater elevation.



**Provide groundwater elevation contours and an indication of the groundwater flow direction.**

**Figure 7 – POE Location Map**

A site investigation involving an evaluation of potential receptors has not been performed or requested by the OPS.

This figure will identify each property in the vicinity of the site which could potentially be affected by the release. The properties will be illustrated by land use (e.g., single family residential, vacant land, retail, dry cleaning, gas station, etc.). This figure will also identify all potential POEs (property boundaries, surficial soils, subsurface utilities, groundwater wells and surface water features/sensitive environments).

**Figure 8 – Area Surface Water, Groundwater, Topographical Map**

This map is used to provide regional topographic and POE information. Include a portion of a U.S.G.S. 7 2' Quadrangle Topographic Map or equivalent, measuring a minimum of six inches by six inches with the site located in the middle of the six inch by six inch section. The map shall include a scale (approximately 1" = 2,000'), distinct site location marker, and geographic contour intervals. Clearly identify surface water features and water wells (excluding monitoring wells) within ½-mile radius of the site. Provide a text box with the associated permit number (as indicated in Table 6) of each water well location.

Note: A groundwater well inventory has no been performed or requested by the OPS.

**3. LABORATORY DOCUMENTATION (Appendix D)**

Chain of Custody forms which accompany samples for laboratory analyses are required to contain the following information: site name and address, sample number, date and time sampled, matrix description (e.g. soil, water), container size, type and decontamination status (e.g. 40 ml laboratory decontaminated amber glass VOA vial), preservation method (e.g. HCl 5%, 4E C), date and method of transport to laboratory (e.g. hand delivered, Fed Ex etc.), analyte and methodology of analyses requested (e.g. Total Extractable Petroleum Hydrocarbons (TEPH) by EPA Method 8015 Modified), and the name and signature of the person collecting the samples. Also attach all laboratory reports, and laboratory quality assurance/quality control reports.

**4. BOREHOLE LITHOLOGIC LOGS AND WELL COMPLETION (Appendix E)**

A site investigation involving borehole has not been performed or requested by the OPS.

Boring logs must include the site name and address, boring number, date completed, surface elevation, depth, borehole diameter, initial and static water levels (if available), drilling method, sampling method, lithologic graphic to scale, an indication of the intervals from which samples were obtained, results of VOC screening, and a geologic description and/or Unified Soil Classification System (USCS) class of each rock or soil type encountered including any staining or petroleum odors.

The following additional information should be included with the lithologic logs if a well has been completed. Include the total depth of the well, the casing elevation, the diameter of the well casing, the well casing material (e.g. PVC, stainless steel), the length and depth

of the screened interval, the size and type of perforations of the screen (e.g. 0.010" milled slots), the type of filter pack material placed in the well (e.g. 10-20 mesh washed silica sand), the type of annular seal (e.g. 1/2" bentonite pellets), the type of grout used to fill the remaining annular space (e.g. Portland cement 5% bentonite), the type of well casing cap, the method of securing the well casing cap, and the type of protective surface casing. Also included should be a well completion graphic to scale which indicates the depth to the top of the filter pack, the depth to the top of the annular seal, and the location of the screened interval.

Also included in Appendix E should be any cross-sections completed to illustrate site conditions.

#### **5. WASTE DISPOSAL MANIFESTS (Appendix F)**

Contaminated soil removal has not been performed or requested by the OPS.

Attach copies of all manifests provided by transporters, landfills, treatment facilities, etc.

#### **6. SITE CLASSIFICATION CHECKLIST (Appendix G)**

To complete the Site Classification Checklist, place a check in the Threat (T) box if the situation, designated by sub-class (SUB), exists at the site. If the threat does not exist, check the N box. The U box should only have been checked when the Site Classification Checklist was submitted with the Site Summary Form. Upon completion of this report all conditions which exist at the site should be known. Check the Response (R) box if an appropriate response action has been completed for the existing condition at the site. If the response action has been completed and the threat no longer exists, the site classification will be the classification of the next most highly listed threat. The site will be classified by the first table where a threat box has been checked and an appropriate response has not been completed. However, complete the entire form and perform appropriate response actions for each condition which exists at the site. Complete response actions in order of highest priority (1 being the highest).

#### **7. SUPPORTING DOCUMENTATION (Appendix H)**

Attach all supporting documentation as required(e.g., permits for initial response and abatement activities, industrial zoning designation, water quality designation, etc.).

**APPENDIX B - TABLES**

**TABLE 1- SUMMARY OF ORGANIC VAPOR METER READINGS**

OVM measurements were not taken during our site investigation, as an OVM meter was not readily available.

| Sample Location I.D. | Date | Sample Depth (ft) | OVM Reading (ppm) | Laboratory Analyzed (y/n) |
|----------------------|------|-------------------|-------------------|---------------------------|
| N/A                  | N/A  | N/A               | N/A               | N/A                       |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
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|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |

N/D = Not Detected

N/A = Not Analyzed

## TABLE 2 - SUMMARY OF SOIL LABORATORY RESULTS

[illegible]

Identify any sample results which exceed Tier 1 RBSLs for soil leaching to groundwater pathway or 500mg/Kg TPH by presenting those results in bold typeface.

**N/D = Less than the stated laboratory detection limit**

**N/A = Not Analyzed**

\* If ☐ yes, list other analytes detected in a separate table

characterization (WC)

**TABLE 2a - SUMMARY OF SOIL PAH LABORATORY RESULTS**

| Sample Collection Date | Compound                | Concentration mg/Kg | Depth sample collected (ft) | Sample # of TPH Sample | TPH Concentration in Original Sample mg/Kg |
|------------------------|-------------------------|---------------------|-----------------------------|------------------------|--------------------------------------------|
| 2/8/2007               | Acenaphthene            | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Acenaphthylene          | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Anthracene              | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Benzo(a)-anthracene     | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Benzo(a)-pyrene         | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Benzo(b)-fluoranthene   | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Benzo(g,h,i)-perylene   | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Benzo(k)-fluoranthene   | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Chrysene                | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Dibenzo(a,h)-anthracene | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Fluoranthene            | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Fluorene                | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Indeno(1,2,3-CD)-pyrene | < .180              | 1½                          | Diesel                 | 6,600                                      |
|                        | Naphthalene             | 1.90                | 1½                          | Diesel                 | 6,600                                      |
|                        | Phenanthrene            | 0.07                | 1½                          | Diesel                 | 6,600                                      |
|                        | Pyrene                  | < .180              | 1½                          | Diesel                 | 6,600                                      |

Identify any sample results which exceed Tier 1 RBSLs for the surficial soil pathway by presenting those results in bold typeface.

Responses which are common to all compounds (e.g., Sample collection date) only need to be completed for the first compound.

Repeat table if more than one sample is analyzed for PAHs

N/D = Less than the stated laboratory detection limit

N/A = Not Analyze



A site characterization involving an evaluation of vapors has not been performed or requested by the OPS.

[illegible]

N/D = Less than the stated laboratory detection limit

N/A = Not Analyzed

\* If ☐ yes ☐ no, list other analytes detected in a separate table

**\*\*\*Rationale – Assist in defining extent (DE). Identify threats to points of exposure (POE)**

a maximum

[illegible]

Identify any sample results which exceed Colorado Groundwater Standards (MCLs) by presenting those results in bold typeface.

N/D = Less than the stated laboratory detection limit

N/A = Not Analyzed

\* If ☐ yes ☐ no, list other analytes detected in a separate table

\*\*\*Rationale – Release confirmation (RC), In plume (IP), Upgradient (UG), Downgradient (DG), Point of Compliance (POC), Define extent (DE), Waste characterization (WC)

A site characterization involving wells and borings has not been completed or requested by the OPS. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS

[illegible]

## TABLE 6 - SUMMARY OF WATER WELL INFORMATION

A site characterization involving wells and borings has not been completed or requested by the OPS. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

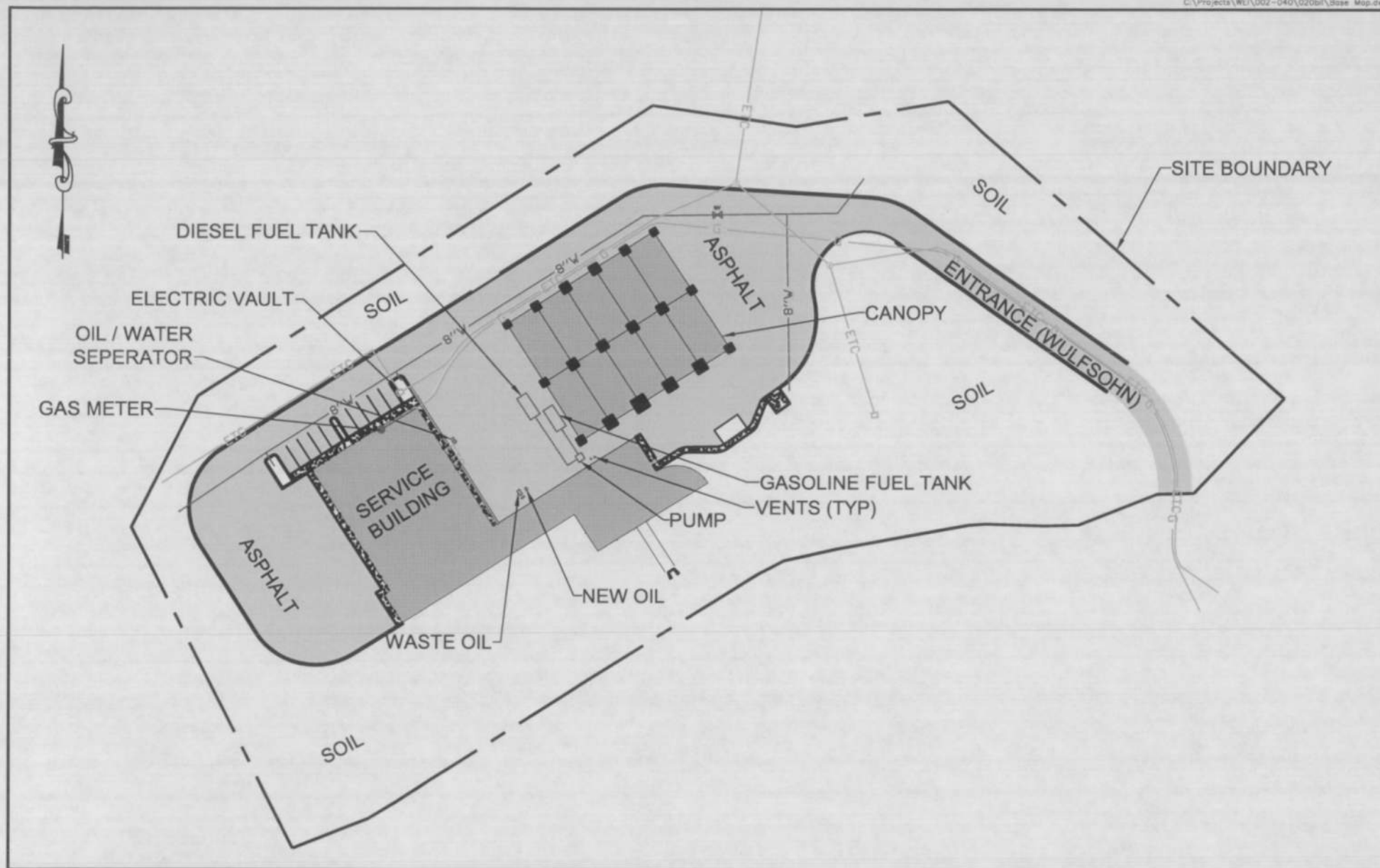
[illegible]

**\*Information from the Colorado Division of Water Resources**

Indicate any wells which appear to be downgradient of the site in bold typeface.

Uses: 0 = Other Use, OM = Other Use (Monitoring Well), 1 = Agricultural, 3 = Commercial Use, 8 = Domestic Use, 9 = Livestock Use

## APPENDIX C - FIGURES


**WEI**

WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 04/12/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY

FIGURE 1  
SITE MAP



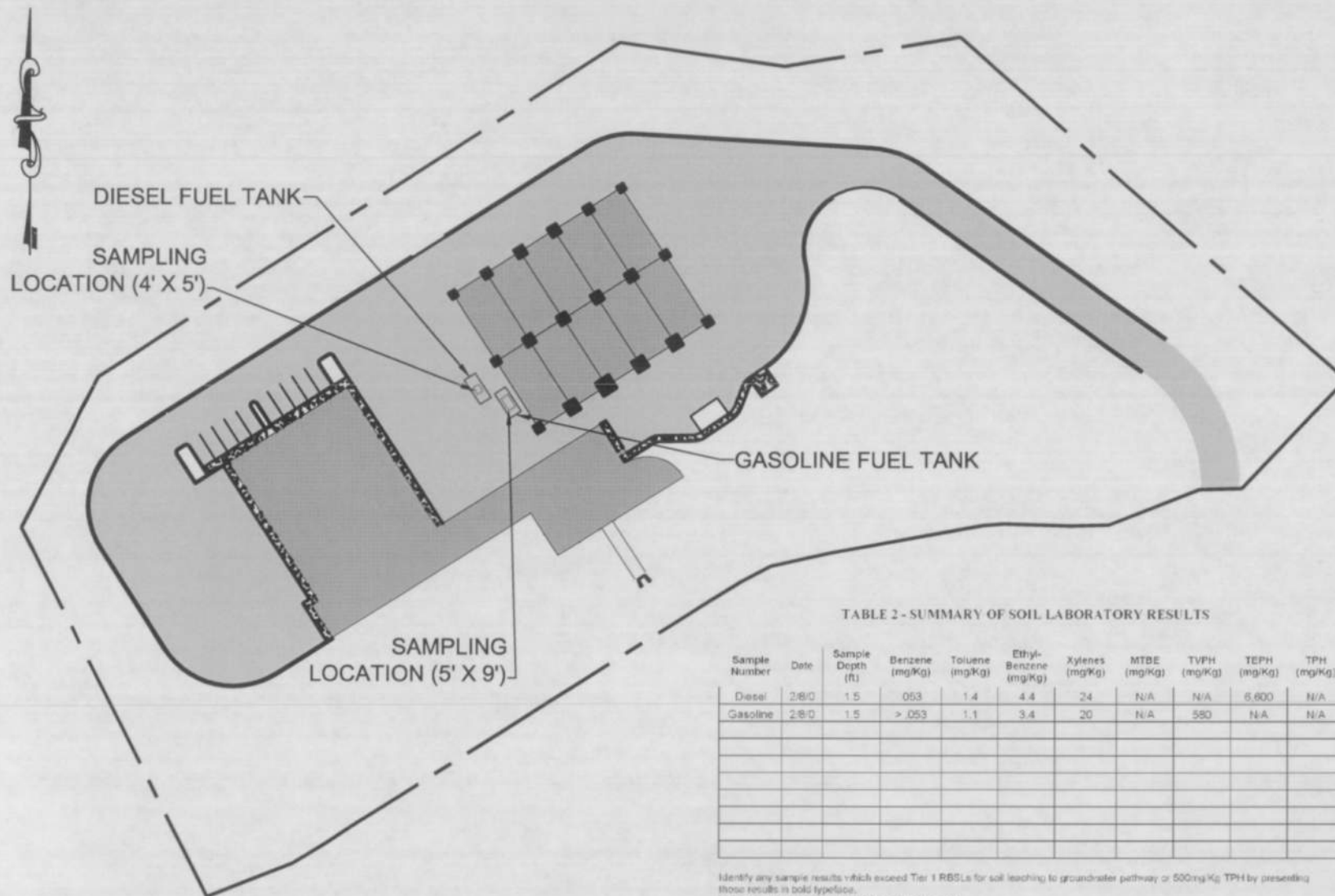


TABLE 2 - SUMMARY OF SOIL LABORATORY RESULTS

| Sample Number | Date  | Sample Depth (ft) | Benzene (mg/Kg) | Toluene (mg/Kg) | Ethyl-Benzene (mg/Kg) | Xylenes (mg/Kg) | MTBE (mg/Kg) | TVPH (mg/Kg) | TEPH (mg/Kg) | TPH (mg/Kg) | Oil & Grease (mg/Kg) | Other Analytes? * (y/n) | Rationale** |
|---------------|-------|-------------------|-----------------|-----------------|-----------------------|-----------------|--------------|--------------|--------------|-------------|----------------------|-------------------------|-------------|
| Diesel        | 2/8/0 | 1.5               | 053             | 1.4             | 4.4                   | 24              | N/A          | N/A          | 6,600        | N/A         | N/A                  | Y                       | RC          |
| Gasoline      | 2/8/0 | 1.5               | > .053          | 1.1             | 3.4                   | 20              | N/A          | 580          | N/A          | N/A         | N/A                  | N                       | RC          |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |
|               |       |                   |                 |                 |                       |                 |              |              |              |             |                      |                         |             |

Identify any sample results which exceed Tier 1 RBSLs for soil leaching to groundwater pathway or 500mg/Kg TPH by presenting those results in bold typeface.

N/D = Less than the stated laboratory detection limit

N/A = Not Analyzed

\* If "yes?", list other analytes detected in a separate table

\*\*Rationale - Release confirmation (RC), In place (IP), Upgradient (UG), Downgradient (DG), Point of Compliance (POC), Post excavation (PE), Define extent (DE), Waste characterization (WC)

# WEI

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DESIGN BLL  
DETAIL BLL  
CHECK DCH  
DATE 04/12/07  
SCALE 1" = 100'

ROARING FORK TRANSIT AUTHORITY  
FIGURE 2  
EXCAVATION SAMPLE LOCATION MAP



THE TWO SOIL SAMPLES  
WERE NOT SCREENED  
USING AN OVM

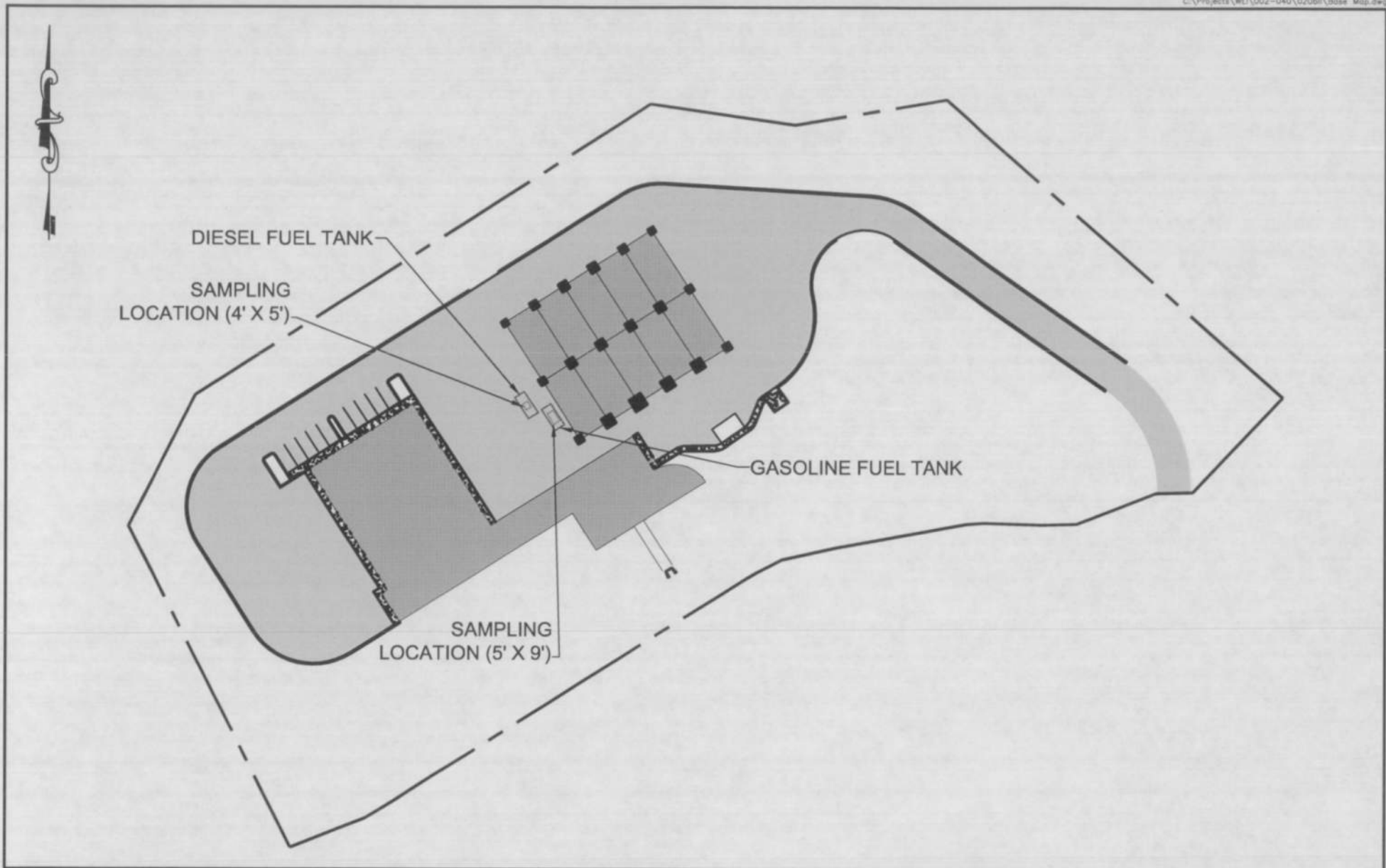
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FIGURE 2a  
OVM SCREENING LOCATIONS



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| CHECK  | DCH       |
| DATE   | 04/12/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY  
FIGURE 3  
SOIL SAMPLE LOCATION MAP

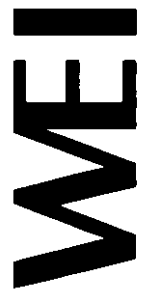
A SITE INVESTIGATION INVOLVING  
VAPOR SAMPLING HAS NOT BEEN  
PERFORMED OR REQUESTED BY  
THE OPS



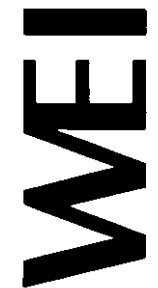
ROARING FORK TRANSIT AUTHORITY  
FIGURE 4  
VAPOR SAMPLING LOCATION MAP

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DESIGN                 
DETAIL                 
CHECK                 
DATE 04/12/07  
SCALE 1" = 100'



A SITE INVESTIGATION INVOLVING  
A GROUNDWATER EVALUATION  
HAS NOT BEEN PERFORMED OR  
REQUESTED BY THE OPS



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|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 04/04/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY

FIGURE 5

GROUNDWATER SAMPLING LOCATION MAP

A SITE INVESTIGATION INVOLVING  
A GROUNDWATER EVALUATION  
HAS NOT BEEN PERFORMED OR  
REQUESTED BY THE OPS

ROARING FORK TRANSIT AUTHORITY

FIGURE 6  
GROUNDWATER ELVATION MAP

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ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 04/04/07  |
| SCALE  | 1" = 100' |

**WEI**



A SITE INVESTIGATION INVOLVING AN  
EVALUATION OF POTENTIAL RECEPTORS  
HAS NOT BEEN PERFORMED OR  
REQUESTED BY THE OPS



ROARING FORK TRANSIT AUTHORITY

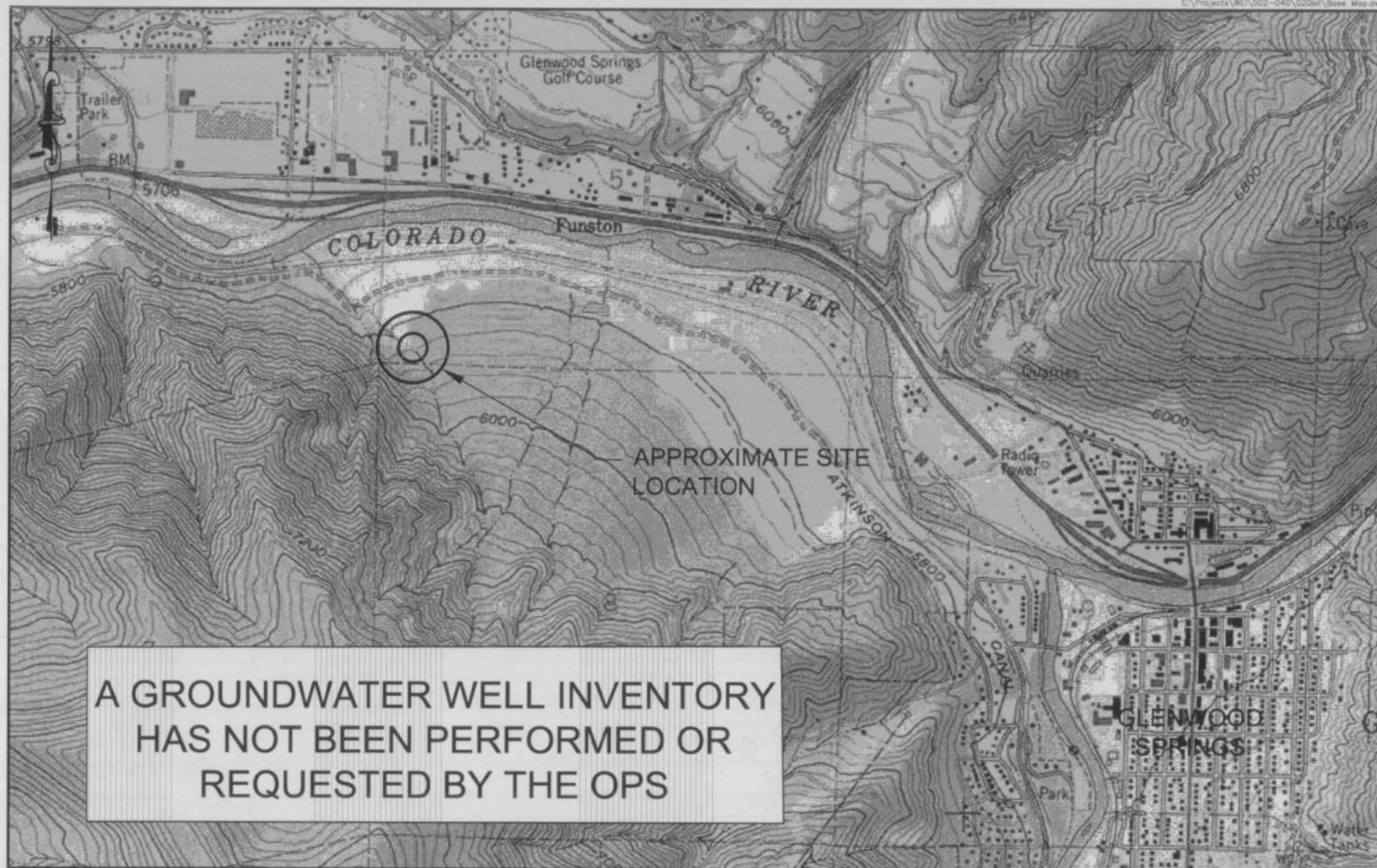
FIGURE 7

POE LOCATION MAP

WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BILL      |
| DETAIL | BILL      |
| CHECK  | DCH       |
| DATE   | 04/04/07  |
| SCALE  | 1" = 100' |

**WEL**


**WEI**

WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 04/04/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY  
FIGURE 8  
AREA SURFACE WATER, GROUNDWATER,  
TOPOGRAPHICAL MAP

**APPENDIX D - LABORATORY DOCUMENTATION**



Analytica Environmental  
Laboratories, Inc.  
12189 Pennsylvania Street  
Thornton, CO 80241  
Phone: 303-469-8868  
Fax: 303-469-5254

2/15/2007

Waste Engineering, Inc.  
P.O. Box 219  
Glenwood Springs, CO 81602  
Attn: Craig Heydenberk

Work Order #: B0702099  
Date: 2/15/2007  
Work ID: RFTA-GWS  
Date Received: 2/10/2007  
Proj #: none

**Sample Identification**

| Lab Sample Number | Client Description | Lab Sample Number | Client Description |
|-------------------|--------------------|-------------------|--------------------|
| B0702099-01       | Diesel Tank        | B0702099-02       | Gasoline Tank      |

Enclosed are the analytical results for the submitted sample(s). Please review the CASE NARRATIVE for a discussion of any data and/or quality control issues. Listings of data qualifiers, analytical codes, key dates, and QC relationships are provided at the end of the report.

Sincerely,

Joseph Egry  
Project Manager

*"The Science of Analysis, The Art of Service"*

## Case Narrative

Analytica Environmental Laboratories, Inc.

Work Order: B0702099

Samples were prepared and analyzed according to EPA or equivalent methods outlined in the following references:

Test Methods for Evaluating Solid Waste, USEPA SW-846, Third Edition, Revision 4, December 1996.

Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures, ASTM D 2216-80, July 1980.

### REVIEW FOR COMPLIANCE WITH ANALYTICA QA PLAN

A summary of our review is shown below, organized by test:

#### SAMPLE RECEIPT:

Two (2) samples were received at a temperature of 4.6 deg C at Analytica-Thornton on 2/10/2007 12:00:00 PM. The samples were received in good condition and in order per chain of custody.

Test Method: Aromatic VOCs by GC/PID via method 8021B - BTEX - Solid

#### HOLDING TIMES:

Holding times were met for this Test

#### SAMPLE PREPARATION ISSUES AND OBSERVATIONS:

There were no unusual observations.

#### INSTRUMENT PERFORMANCE CHECKS:

Instrument checks were within method criteria.

#### INITIAL CALIBRATIONS:

Initial calibrations were within method criteria.

#### OPENING CONTINUING CALIBRATIONS:

Opening continuing calibrations were within method criteria.

#### CLOSING CONTINUING CALIBRATIONS:

Closing continuing calibrations were within method criteria or not applicable.

#### INTERNAL STANDARD AREAS:

There were no Internal Standard outliers.

#### SURROGATE RECOVERIES:

The samples shown below have the surrogate outside of control windows. This result was confirmed by reanalysis. The LCS, and method blank do not show this effect and this is considered likely to be due to sample matrix.

| Sample        | LabID        | Surrogate            | Recovery | LCL | UCL          |
|---------------|--------------|----------------------|----------|-----|--------------|
| Diesel Tank   | B0702099-01B | p-Bromofluorobenzene | 46.      | 77  | 120 Complete |
| Gasoline Tank | B0702099-02A | p-Bromofluorobenzene | 49.      | 77  | 120 Complete |
| Diesel Tank   | B0702099-01B | p-Bromofluorobenzene | 47.      | 77  | 120 Rrun     |
| Gasoline Tank | B0702099-02A | p-Bromofluorobenzene | 44.      | 77  | 120 Rrun     |

#### METHOD BLANK OUTLIERS:

There are no method blank outliers.

## Case Narrative

Analytica Environmental Laboratories, Inc.

Work Order: B0702099

(continued)

### LCS OUTLIERS:

There are no LCS outliers.

### MS/MSD and DUP OUTLIERS:

There are no MS/MSD or DUP outliers.

Test Method: ASTM D2216 - Pmoist - Solid

All method criteria was met for this test.

Test Method: SVOC by GC/FID via method 8015B - DRO - Solid

### HOLDING TIMES:

Holding times were met for this Test

### SAMPLE PREPARATION ISSUES AND OBSERVATIONS:

There were no unusual observations.

### INSTRUMENT PERFORMANCE CHECKS:

Instrument checks were within method criteria.

### INITIAL CALIBRATIONS:

Initial calibrations were within method criteria.

### OPENING CONTINUING CALIBRATIONS:

Opening continuing calibrations were within method criteria.

### CLOSING CONTINUING CALIBRATIONS:

Closing continuing calibrations were within method criteria or not applicable.

### SURROGATE RECOVERIES:

There were no surrogate outliers.

### METHOD BLANK OUTLIERS:

There are no method blank outliers.

### LCS OUTLIERS:

There are no LCS outliers.

### MS/MSD and DUP OUTLIERS:

As shown below, the matrix spike and matrix spike duplicate were outside of limits the target. The sample has a concentration greater than four times spike amount. In this case it is not appropriate to calculate a recovery. The result should be used as a replicate.

| Type | Client Sample | LabSample    | Analyte              | Recovery | LCL | UCL | Parent | Spike |
|------|---------------|--------------|----------------------|----------|-----|-----|--------|-------|
| MS   | Diesel Tank   | B0702099-01A | Diesel Range Organic | -801     | 50  | 129 | 6600   | 70.4  |
| MSD  | Diesel Tank   | B0702099-01A | Diesel Range Organic | -540     | 50  | 129 | 6600   | 70.4  |

Test Method: VOC by GC/FID via method 8015B - GRO - Solid

### HOLDING TIMES:

Holding times were met for this Test



## Case Narrative

*Analytica Environmental Laboratories, Inc.*

*Work Order: B0702099*

*(continued)*

Holding times were met for this Test

### SAMPLE PREPARATION ISSUES AND OBSERVATIONS:

There were no unusual observations.

### INSTRUMENT PERFORMANCE CHECKS:

Instrument checks were within method criteria.

### INITIAL CALIBRATIONS:

Initial calibrations were within method criteria.

### OPENING CONTINUING CALIBRATIONS:

Opening continuing calibrations were within method criteria.

### CLOSING CONTINUING CALIBRATIONS:

Closing continuing calibrations were within method criteria or not applicable.

### SURROGATE RECOVERIES:

There were no surrogate outliers.

### METHOD BLANK OUTLIERS:

There are no method blank outliers.

### LCS OUTLIERS:

There are no LCS outliers.

### MS/MSD and DUP OUTLIERS:

There are no MS/MSD or DUP outliers.

**Detailed Analytical Report**

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

**Report Section: Client Sample Report**

Client Sample Name: Diesel Tank

Matrix: Soil

Collection Date: 2/8/2007 9:30:00AM

The following test was conducted by: Analytica - Thornton

Lab Sample Number: B0702099-01A

Prep Date: 2/12/2007

Analytical Method ID: SVOC by GC/FID via method 8015B - DRO

Prep Method ID: 3550B

Prep Batch Number: T070213002

Report Basis: Dry Weight Basis

Sample prep wt./vol: 30.01 g

Analysis Date: 2/13/2007 9:27:18PM

Instrument: GC\_E

File Name: 07021311.D

Dilution Factor: 100

Percent Moisture: 5.50

Analyst Initials: lw

Prep Extract Vol: 1.00 ml

| <u>Analyte</u>        | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> |              |                |            |            |               | <u>run #:</u> |
|-----------------------|--------------|---------------|--------------|--------------|------------|------------|--------------|----------------|------------|------------|---------------|---------------|
| Diesel Range Organics | n/a          | 6,600         |              | mg/Kg        | 530        | 150        |              |                |            |            |               | 2             |
| <u>Surrogate</u>      | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> | <u>Spike</u> | <u>% Recov</u> | <u>LCL</u> | <u>UCL</u> | <u>run #:</u> |               |
| o-Terphenyl           | 84-15-1      | ND            |              | mg/Kg        | 35         | 28         | 1.8          | 108            | 50         | 150        | 2 DIL         |               |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: B0702099-01B

Prep Date: 2/14/2007

Analytical Method ID: Aromatic VOCs by GC/PID via method 8021B - BTEX

Prep Method ID: P&amp;TSoil

Prep Batch Number: T070215005

Report Basis: Dry Weight Basis

Sample prep wt./vol: 5.00 g

Analysis Date: 2/14/2007 3:57:00PM

Instrument: GC\_B

File Name: 07021412.D

Dilution Factor: 100

Percent Moisture: 5.50

Analyst Initials:

Prep Extract Vol: 5.00 ml

| <u>Analyte</u>       | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> |              |                |            |            | <u>run #:</u> |
|----------------------|--------------|---------------|--------------|--------------|------------|------------|--------------|----------------|------------|------------|---------------|
| Benzene              | 71-43-2      | ND            |              | ug/Kg        | 53         | 14         |              |                |            |            | 1             |
| Ethylbenzene         | 100-41-4     | 4,400         |              | ug/Kg        | 110        | 24         |              |                |            |            |               |
| Toluene              | 108-88-3     | 1,400         |              | ug/Kg        | 110        | 21         |              |                |            |            |               |
| Xylenes, Total       | 1330-20-7    | 24,000        |              | ug/Kg        | 210        | 72         |              |                |            |            |               |
| <u>Surrogate</u>     | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> | <u>Spike</u> | <u>% Recov</u> | <u>LCL</u> | <u>UCL</u> | <u>run #:</u> |
| p-Bromofluorobenzene | 460-00-4     | 1,300         |              | ug/Kg        | 53         | 35         | 2,900        | 47.0           | 77         | 120        | 1 LOW         |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

## Report Section: Client Sample Report

Client Sample Name: Gasoline Tank

Matrix: Soil

Collection Date: 2/8/2007 9:30:00AM

The following test was conducted by: Analytica - Thornton

Lab Sample Number: B0702099-02A

Analysis Date: 2/14/2007 5:21:00PM

Prep Date: 2/14/2007

Instrument: GC\_B

Analytical Method ID: Aromatic VOCs by GC/PID via method 8021B - BTEX

File Name: 07021415.D

Prep Method ID: P&TSoil

Dilution Factor: 100

Prep Batch Number: T070215005

Percent Moisture: 5.14

Report Basis: Dry Weight Basis

Analyst Initials:

Sample prep wt./vol: 5.00 g

Prep Extract Vol: 5.00 ml

| Analyte              | CASNo     | Result | Flags | Units | PQL | MDL | run #: |         |     |     |        |
|----------------------|-----------|--------|-------|-------|-----|-----|--------|---------|-----|-----|--------|
| Benzene              | 71-43-2   | ND     |       | ug/Kg | 53  | 14  | 2      |         |     |     |        |
| Ethylbenzene         | 100-41-4  | 3,400  |       | ug/Kg | 110 | 24  |        |         |     |     |        |
| Toluene              | 108-88-3  | 1,100  |       | ug/Kg | 110 | 21  |        |         |     |     |        |
| Xylenes, Total       | 1330-20-7 | 20,000 |       | ug/Kg | 210 | 72  |        |         |     |     |        |
| Surrogate            | CASNo     | Result | Flags | Units | PQL | MDL | Spike  | % Recov | LCL | UCL | run #: |
| p-Bromofluorobenzene | 460-00-4  | 1,400  |       | ug/Kg | 53  | 35  | 2,800  | 49.7    | 77  | 120 | 2 LOW  |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: B0702099-02A

Analysis Date: 2/14/2007 4:53:00PM

Prep Date: 2/14/2007

Instrument: GC\_B

Analytical Method ID: VOC by GC/FID via method 8015B - GRO

File Name: 07021414.D

Prep Method ID: P&TSoil

Dilution Factor: 100

Prep Batch Number: T070215006

Percent Moisture: 5.14

Report Basis: Dry Weight Basis

Analyst Initials:

Sample prep wt./vol: 5.00 g

Prep Extract Vol: 5.00 ml

| Analyte                 | CASNo    | Result  | Flags | Units | PQL    | MDL   | run #: |         |     |     |        |
|-------------------------|----------|---------|-------|-------|--------|-------|--------|---------|-----|-----|--------|
| Gasoline Range Organics | n/a      | 580,000 |       | ug/Kg | 11,000 | 1,400 | 1      |         |     |     |        |
| Surrogate               | CASNo    | Result  | Flags | Units | PQL    | MDL   | Spike  | % Recov | LCL | UCL | run #: |
| p-Bromofluorobenzene    | 460-00-4 | 960     |       | ug/Kg | 160    | 53    | 1,600  | 60.8    | 50  | 150 | 1      |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

## Report Section: Method Blank Report

Client Sample Name:

MB

Matrix: Solid

Collection Date: 2/12/2007 2:30:00PM

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T070213002-MB

Prep Date: 2/12/2007

Analytical Method ID: SVOC by GC/FID via method 8015B - DRO

Prep Method ID: 3550B

Prep Batch Number: T070213002

Report Basis: As Received

Sample prep wt./vol: 30.00 g

Analysis Date: 2/13/2007 4:34:19PM

Instrument: GC\_E

File Name: 07021305.D

Dilution Factor: 1

Percent Moisture: NA

Analyst Initials: lwm

Prep Extract Vol: 1.00 ml

| Analyte               | CASNo   | Result | Flags | Units | PQL  | MDL  |       |         |     |     |        | run #: |
|-----------------------|---------|--------|-------|-------|------|------|-------|---------|-----|-----|--------|--------|
| Diesel Range Organics | n/a     | ND     |       | mg/Kg | 5.0  | 1.4  |       |         |     |     |        | 1      |
| Surrogate             | CASNo   | Result | Flags | Units | PQL  | MDL  | Spike | % Recov | LCL | UCL | run #: |        |
| o-Terphenyl           | 84-15-1 | 2.0    |       | mg/Kg | 0.33 | 0.26 | 1.7   | 119     | 50  | 150 | 1      |        |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T070215005-MB

Prep Date: 2/14/2007

Analytical Method ID: Aromatic VOCs by GC/PID via method 8021B - BTEX

Prep Method ID: P&TSoil

Prep Batch Number: T070215005

Report Basis: As Received

Sample prep wt./vol: 5.00 g

Analysis Date: 2/14/2007 3:30:00PM

Instrument: GC\_B

File Name: 07021411.D

Dilution Factor: 1

Percent Moisture: NA

Analyst Initials:

Prep Extract Vol: 5.00 ml

| <u>Analyte</u>       | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> |              |                |            |            |               | <u>run #:</u> |
|----------------------|--------------|---------------|--------------|--------------|------------|------------|--------------|----------------|------------|------------|---------------|---------------|
| Benzene              | 71-43-2      | ND            |              | ug/Kg        | 0.50       | 0.13       |              |                |            |            |               | 1             |
| Ethylbenzene         | 100-41-4     | ND            |              | ug/Kg        | 1.0        | 0.23       |              |                |            |            |               |               |
| Toluene              | 108-88-3     | ND            |              | ug/Kg        | 1.0        | 0.20       |              |                |            |            |               |               |
| Xylenes, Total       | 1330-20-7    | ND            |              | ug/Kg        | 2.0        | 0.68       |              |                |            |            |               |               |
| <u>Surrogate</u>     | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> | <u>Spike</u> | <u>% Recov</u> | <u>LCL</u> | <u>UCL</u> | <u>run #:</u> |               |
| p-Bromofluorobenzene | 460-00-4     | 26            |              | ug/Kg        | 0.50       | 0.33       | 27           | 94.6           | 77         | 120        | 1             |               |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T070215006-MB

Prep Date: 2/14/2007

Analytical Method ID: VOC by GC/FID via method 8015B - GRO

Prep Method ID: P&TSoil

Prep Batch Number: T070215006

Report Basis: As Received

Sample prep wt./vol: 5.00 g

Analysis Date: 2/14/2007 3:30:00PM

Instrument: GC\_B

File Name: 07021411.D

Dilution Factor: 1

Percent Moisture: NA

Analyst Initials:

Prep Extract Vol: 5.00 ml

| Analyte                 | CASNo    | Result | Flags | Units | PQL | MDL  |       |         |     |     |        | run #: |
|-------------------------|----------|--------|-------|-------|-----|------|-------|---------|-----|-----|--------|--------|
| Gasoline Range Organics | n/a      | ND     |       | ug/Kg | 100 | 13   |       |         |     |     |        | 1      |
| Surrogate               | CASNo    | Result | Flags | Units | PQL | MDL  | Spike | % Recov | LCL | UCL | run #: |        |
| p-Bromofluorobenzene    | 460-00-4 | 13     |       | ug/Kg | 1.5 | 0.50 | 15    | 87.9    | 50  | 150 | 1      |        |

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099  
Project: RFTA-GWS  
Client: Waste Engineering, Inc.  
Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado  
Workorder (SDG): B0702099  
Project: RFTA-GWS  
Project Number:  
Prep Batch: T070213002

### QUALITY CONTROL REPORT

#### LCS/LCSD REPORT

Analysis: SVOC by GC/FID via method 8015B - DRO MB: T070213002-MB  
Prep Date: 2/12/2007  
MB Anal. Date: 2/13/2007 4:34:19PM Units: mg/Kg  
LCS Anal. Date: 2/13/2007 5:23:36PM LCSD Anal. Date: 2/13/2007 6:12:06PM Matrix: Solid

| Analyte Name          | SampResult | LCSRes. | SDRes. | SPLev | SPDLev | Recov. | SD Recov | RPD | Recov Lim | RPDLim | Flag |
|-----------------------|------------|---------|--------|-------|--------|--------|----------|-----|-----------|--------|------|
| Diesel Range Organics | ND         | 70.1    | 72.9   | 66.7  | 66.7   | 105.1  | 109.3    | 3.9 | 75 - 125  | 20     |      |

#### MS/MSD REPORT

Analysis: SVOC by GC/FID via method 8015B - DRO Parent: B0702099-01A  
Prep Date: 2/12/2007  
Samp. Anal. Date: 2/13/2007 9:27:18PM Units: mg/Kg  
MS Anal. Date: 2/13/2007 11:53:16PM MSD Anal. Date: 2/14/2007 2:19:20AM Matrix: Soil

| Analyte Name          | SampResult | MSRes. | MSDRes | SPLev | SPDLev | Recov. | MSD Rec. | RPD | Recov Lim | RPDLim | Flag          |
|-----------------------|------------|--------|--------|-------|--------|--------|----------|-----|-----------|--------|---------------|
| Diesel Range Organics | 6,600      | 6,040  | 6,220  | 70.4  | 70.4   | -795.1 | -539.6   | 2.9 | 50 - 129  | 20     | NOTE 2 NOTE 2 |

#### FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): B0702099

Project: RFTA-GWS

Project Number:

Prep Batch: T070214007

### QUALITY CONTROL REPORT

#### SAMPLE DUPLICATE REPORT

Analysis: ASTM D2216 - Pmoist

Base Sample: B0702099-01A

Prep Date: 2/12/2007

Samp. Anal. Date: 2/12/2007 3:00:00PM

Units: %

DUP Anal. Date: 2/12/2007 3:00:00PM

Matrix: Soil

| Analyte Name | SampResult | DUPRes. | RPD  | RPDLim | Flag |
|--------------|------------|---------|------|--------|------|
| Moisture     | 5.50       | 6.21    | 12.1 | 20     |      |

Prep Batch: T070215001

#### SAMPLE DUPLICATE REPORT

Analysis: ASTM D2216 - Pmoist

Base Sample: B0702099-02B

Prep Date: 2/14/2007

Samp. Anal. Date: 2/14/2007 4:05:00PM

Units: %

DUP Anal. Date: 2/14/2007 4:05:00PM

Matrix: Soil

| Analyte Name | SampResult | DUPRes. | RPD  | RPDLim | Flag |
|--------------|------------|---------|------|--------|------|
| Moisture     | 5.14       | 5.80    | 12.1 | 20     |      |

#### FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.



## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): B0702099

Project: RFTA-GWS

Project Number:

Prep Batch: T070215006

### QUALITY CONTROL REPORT

#### LCS/LCSD REPORT

Analysis: VOC by GC/FID via method 8015B - GRO

MB: T070215006-MB

Prep Date: 2/14/2007

MB Anal. Date: 2/14/2007 3:30:00PM

Units: ug/Kg

LCS Anal. Date: 2/14/2007 2:34:00PM LCSD Anal. Date: 2/14/2007 3:02:00PM Matrix: Solid

| Analyte Name            | SampResult | LCSRes. | SDRes. | SPLev | SPDLev | Recov. | SD Recov | RPD | Recov Lim | RPDLim | Flag |
|-------------------------|------------|---------|--------|-------|--------|--------|----------|-----|-----------|--------|------|
| Gasoline Range Organics | ND         | 443     | 451    | 500   | 500    | 88.6   | 90.2     | 1.8 | 60 - 118  | 20     |      |

Prep Batch: T070215005

#### LCS/LCSD REPORT

Analysis: Aromatic VOCs by GC/PID via method 8021B - BTEX

MB: T070215005-MB

Prep Date: 2/14/2007

MB Anal. Date: 2/14/2007 3:30:00PM

Units: ug/Kg

LCS Anal. Date: 2/14/2007 1:38:00PM LCSD Anal. Date: 2/14/2007 2:06:00PM Matrix: Solid

| Analyte Name   | SampResult | LCSRes. | SDRes. | SPLev | SPDLev | Recov. | SD Recov | RPD | Recov Lim | RPDLim | Flag |
|----------------|------------|---------|--------|-------|--------|--------|----------|-----|-----------|--------|------|
| Benzene        | ND         | 10.6    | 10.6   | 10.0  | 10.0   | 106.0  | 106.0    | 0.0 | 70 - 130  | 20     |      |
| Toluene        | ND         | 10.4    | 10.4   | 10.0  | 10.0   | 104.0  | 104.0    | 0.0 | 70 - 130  | 20     |      |
| Ethylbenzene   | ND         | 10.3    | 10.3   | 10.0  | 10.0   | 103.0  | 103.0    | 0.0 | 70 - 130  | 20     |      |
| Xylenes, Total | ND         | 31.2    | 31.3   | 30.0  | 30.0   | 104.0  | 104.3    | 0.3 | 77 - 112  | 20     |      |

#### FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

### SURROGATE RECOVERY SUMMARY REPORT

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Test Method: SVOC by GC/FID via method 8015B - DRO

|                    |                     |                |                    |               |                      |
|--------------------|---------------------|----------------|--------------------|---------------|----------------------|
| Lab Sample #:      | B0702099-01A        | Dilution:      | 1                  |               |                      |
| Analysis Date:     | 2/13/2007 7:49:48PM | Client Sample: | <u>Diesel Tank</u> |               |                      |
| Batch Number:      | T070213002          | Data File:     | 07021309.D         |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u>         | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 218                 | 50             | 150                | HIGH          | Rrun                 |

|                    |                     |                |                    |               |                      |
|--------------------|---------------------|----------------|--------------------|---------------|----------------------|
| Lab Sample #:      | B0702099-01A        | Dilution:      | 100                |               |                      |
| Analysis Date:     | 2/13/2007 9:27:18PM | Client Sample: | <u>Diesel Tank</u> |               |                      |
| Batch Number:      | T070213002          | Data File:     | 07021311.D         |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u>         | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 108                 | 50             | 150                |               | DILUTED OUT Complete |

|                    |                     |                |            |               |                      |
|--------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:      | T070213002-MB       | Dilution:      | 1          |               |                      |
| Analysis Date:     | 2/13/2007 4:34:19PM | Client Sample: | <u>MB</u>  |               |                      |
| Batch Number:      | T070213002          | Data File:     | 07021305.D |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 119                 | 60             | 120        |               | Complete             |

|                    |                     |                |            |               |                      |
|--------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:      | T070213002-LCS      | Dilution:      | 1          |               |                      |
| Analysis Date:     | 2/13/2007 5:23:36PM | Client Sample: | <u>LCS</u> |               |                      |
| Batch Number:      | T070213002          | Data File:     | 07021306.D |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 97                  | 60             | 120        |               | Complete             |

|                    |                     |                |             |               |                      |
|--------------------|---------------------|----------------|-------------|---------------|----------------------|
| Lab Sample #:      | T070213002-LCSD     | Dilution:      | 1           |               |                      |
| Analysis Date:     | 2/13/2007 6:12:06PM | Client Sample: | <u>LCSD</u> |               |                      |
| Batch Number:      | T070213002          | Data File:     | 07021307.D  |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u>  | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 92                  | 60             | 120         |               | Complete             |

|                    |                      |                |            |               |                      |
|--------------------|----------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:      | B0702099-01A-MS      | Dilution:      | 1          |               |                      |
| Analysis Date:     | 2/13/2007 10:15:51PM | Client Sample: | <u>MS</u>  |               |                      |
| Batch Number:      | T070213002           | Data File:     | 07021312.D |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>       | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 221                  | 50             | 150        | HIGH          | Rrun                 |

|                    |                      |                |            |               |                      |
|--------------------|----------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:      | B0702099-01A-MS      | Dilution:      | 100        |               |                      |
| Analysis Date:     | 2/13/2007 11:53:16PM | Client Sample: | <u>MS</u>  |               |                      |
| Batch Number:      | T070213002           | Data File:     | 07021314.D |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>       | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 94                   | 50             | 150        |               | DILUTED OUT Complete |

|                    |                      |                |            |               |                      |
|--------------------|----------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:      | B0702099-01A-MSD     | Dilution:      | 1          |               |                      |
| Analysis Date:     | 2/14/2007 12:42:05AM | Client Sample: | <u>MSD</u> |               |                      |
| Batch Number:      | T070213002           | Data File:     | 07021315.D |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>       | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        | 239                  | 50             | 150        | HIGH          | Rrun                 |

|                    |                     |                |            |               |                      |
|--------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:      | B0702099-01A-MSD    | Dilution:      | 100        |               |                      |
| Analysis Date:     | 2/14/2007 2:19:20AM | Client Sample: | <u>MSD</u> |               |                      |
| Batch Number:      | T070213002          | Data File:     | 07021317.D |               |                      |
| <u>AnalyteName</u> | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| o-Terphenyl        |                     |                |            |               |                      |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Test Method: SVOC by GC/FID via method 8015B - DRO

Lab Sample #: B0702099-01A-MSD Dilution: 100  
Analysis Date: 2/14/2007 2:19:20AM Client Sample: MSD  
Batch Number: T070213002 Data File: 07021317.D

| <u>AnalyteName</u> | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|--------------------|----------------|------------|------------|---------------|----------------------|
| o-Terphenyl        | 100            | 50         | 150        | DILUTED OUT   | Complete             |

Test Method: Aromatic VOCs by GC/PID via method 8021B - BTEX

Lab Sample #: B0702099-01B Dilution: 100  
Analysis Date: 2/14/2007 3:57:00PM Client Sample: Diesel Tank  
Batch Number: T070215005 Data File: 07021412.D

| <u>AnalyteName</u>   | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|----------------------|----------------|------------|------------|---------------|----------------------|
| p-Bromofluorobenzene | 47             | 77         | 120        | LOW           | Complete             |

Lab Sample #: B0702099-01B Dilution: 100  
Analysis Date: 2/14/2007 4:25:00PM Client Sample: Diesel Tank  
Batch Number: T070215005 Data File: 07021413.D

| <u>AnalyteName</u>   | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|----------------------|----------------|------------|------------|---------------|----------------------|
| p-Bromofluorobenzene | 48             | 77         | 120        | LOW           | Rrun                 |

Lab Sample #: B0702099-02A Dilution: 100  
Analysis Date: 2/14/2007 4:53:00PM Client Sample: Gasoline Tank  
Batch Number: T070215005 Data File: 07021414.D

| <u>AnalyteName</u>   | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|----------------------|----------------|------------|------------|---------------|----------------------|
| p-Bromofluorobenzene | 44             | 77         | 120        | LOW           | Rrun                 |

Lab Sample #: B0702099-02A Dilution: 100  
Analysis Date: 2/14/2007 5:21:00PM Client Sample: Gasoline Tank  
Batch Number: T070215005 Data File: 07021415.D

| <u>AnalyteName</u>   | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|----------------------|----------------|------------|------------|---------------|----------------------|
| p-Bromofluorobenzene | 50             | 77         | 120        | LOW           | Complete             |

Lab Sample #: T070215005-MB Dilution: 1  
Analysis Date: 2/14/2007 3:30:00PM Client Sample: MB  
Batch Number: T070215005 Data File: 07021411.D

| <u>AnalyteName</u>   | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|----------------------|----------------|------------|------------|---------------|----------------------|
| p-Bromofluorobenzene | 95             | 77         | 120        |               | Complete             |

Lab Sample #: T070215005-LCS Dilution: 1  
Analysis Date: 2/14/2007 1:38:00PM Client Sample: LCS  
Batch Number: T070215005 Data File: 07021407.D

| <u>AnalyteName</u>   | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|----------------------|----------------|------------|------------|---------------|----------------------|
| p-Bromofluorobenzene | 99             | 77         | 120        |               | Complete             |

Lab Sample #: T070215005-LCSD Dilution: 1  
Analysis Date: 2/14/2007 2:06:00PM Client Sample: LCSD  
Batch Number: T070215005 Data File: 07021408.D

| <u>AnalyteName</u>   | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|----------------------|----------------|------------|------------|---------------|----------------------|
| p-Bromofluorobenzene | 100            | 77         | 120        |               | Complete             |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Test Method: VOC by GC/FID via method 8015B - GRO

|                      |                     |                |                      |               |                      |
|----------------------|---------------------|----------------|----------------------|---------------|----------------------|
| Lab Sample #:        | B0702099-02A        | Dilution:      | 100                  |               |                      |
| Analysis Date:       | 2/14/2007 4:53:00PM | Client Sample: | <u>Gasoline Tank</u> |               |                      |
| Batch Number:        | T070215006          | Data File:     | 07021414.D           |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u>           | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 61                  | 50             | 150                  |               | Complete             |

|                      |                     |                |                      |               |                      |
|----------------------|---------------------|----------------|----------------------|---------------|----------------------|
| Lab Sample #:        | B0702099-02A        | Dilution:      | 100                  |               |                      |
| Analysis Date:       | 2/14/2007 5:21:00PM | Client Sample: | <u>Gasoline Tank</u> |               |                      |
| Batch Number:        | T070215006          | Data File:     | 07021415.D           |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u>           | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 68                  | 50             | 150                  |               | Rrun                 |

|                      |                     |                |            |               |                      |
|----------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | T070215006-MB       | Dilution:      | 1          |               |                      |
| Analysis Date:       | 2/14/2007 3:30:00PM | Client Sample: | <u>MB</u>  |               |                      |
| Batch Number:        | T070215006          | Data File:     | 07021411.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 88                  | 63             | 130        |               | Complete             |

|                      |                     |                |            |               |                      |
|----------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | T070215006-LCS      | Dilution:      | 1          |               |                      |
| Analysis Date:       | 2/14/2007 2:34:00PM | Client Sample: | <u>LCS</u> |               |                      |
| Batch Number:        | T070215006          | Data File:     | 07021409.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 90                  | 63             | 130        |               | Complete             |

|                      |                     |                |             |               |                      |
|----------------------|---------------------|----------------|-------------|---------------|----------------------|
| Lab Sample #:        | T070215006-LCSD     | Dilution:      | 1           |               |                      |
| Analysis Date:       | 2/14/2007 3:02:00PM | Client Sample: | <u>LCSD</u> |               |                      |
| Batch Number:        | T070215006          | Data File:     | 07021410.D  |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u>  | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 92                  | 63             | 130         |               | Complete             |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099  
Project: RFTA-GWS  
Client: Waste Engineering, Inc.  
Client Project Number: none

## QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 68,650 Lab Project Number: B0702099

Prep Date: 2/12/2007

Lab Method Blank Id: T070213002-MB  
Prep Batch ID: T070213002  
Method: SVOC by GC/FID via method 8015B - DRO

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u>  |
|------------------|-------------------------|-----------------|----------------------|
| T070213002-LCS   | LCS                     | 07021306.D      | 2/13/2007 5:23:36PM  |
| T070213002-LCSD  | LCSD                    | 07021307.D      | 2/13/2007 6:12:06PM  |
| B0702099-01A     | Diesel Tank             | 07021311.D      | 2/13/2007 9:27:18PM  |
| B0702099-01A-MS  | MS                      | 07021314.D      | 2/13/2007 11:53:16PM |
| B0702099-01A-MSD | MSD                     | 07021317.D      | 2/14/2007 2:19:20AM  |

Prep Date: 2/12/2007

Lab Method Blank Id: T070214007-MB  
Prep Batch ID: T070214007  
Method: ASTM D2216 - Pmoist

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u> |
|------------------|-------------------------|-----------------|---------------------|
| B0702099-01A     | Diesel Tank             |                 | 2/12/2007 3:00:00PM |
| B0702099-01A-DUP | DUP                     |                 | 2/12/2007 3:00:00PM |

Prep Date: 2/14/2007

Lab Method Blank Id: T070215001-MB  
Prep Batch ID: T070215001  
Method: ASTM D2216 - Pmoist

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u> |
|------------------|-------------------------|-----------------|---------------------|
| B0702099-02B     | Gasoline Tank           |                 | 2/14/2007 4:05:00PM |
| B0702099-02B-DUP | DUP                     |                 | 2/14/2007 4:05:00PM |

Prep Date: 2/14/2007

Lab Method Blank Id: T070215005-MB  
Prep Batch ID: T070215005  
Method: Aromatic VOCs by GC/PID via method 8021B - BTEX

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u> |
|------------------|-------------------------|-----------------|---------------------|
| T070215005-LCS   | LCS                     | 07021407.D      | 2/14/2007 1:38:00PM |
| T070215005-LCSD  | LCSD                    | 07021408.D      | 2/14/2007 2:06:00PM |
| B0702099-01B     | Diesel Tank             | 07021412.D      | 2/14/2007 3:57:00PM |
| B0702099-02A     | Gasoline Tank           | 07021415.D      | 2/14/2007 5:21:00PM |



## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

### QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 68,650

Lab Project Number: B0702099

Prep Date: 2/14/2007

Lab Method Blank Id: T070215006-MB

Prep Batch ID: T070215006

Method: VOC by GC/FID via method 8015B - GRO

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u> |
|------------------|-------------------------|-----------------|---------------------|
| T070215006-LCS   | LCS                     | 07021409.D      | 2/14/2007 2:34:00PM |
| T070215006-LCSD  | LCSD                    | 07021410.D      | 2/14/2007 3:02:00PM |
| B0702099-02A     | Gasoline Tank           | 07021414.D      | 2/14/2007 4:53:00PM |

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

### DATA FLAGS AND DEFINITIONS

The PQL is the Method Quantitation Limit as defined by USACE.

Reporting Limit: Limit below which results are shown as "ND". This may be the PQL, MDL, or a value between. See the report conventions below.

#### Result Field:

ND = Not Detected at or above the Reporting Limit

NA = Analyte not applicable (see Case Narrative for discussion)

#### Qualifier Fields:

LOW = Recovery is below Lower Control Limit

HIGH = Recovery, RPD, or other parameter is above Upper Control Limit

E = Reported concentration is above the instrument calibration upper range

#### Organic Analysis Flags:

B = Analyte was detected in the laboratory method blank

J = Analyte was detected above MDL or Reporting Limit but below the Quant Limit (PQL)

#### Inorganic Analysis Flags:

J = Analyte was detected above the Reporting Limit but below the Quant Limit (PQL)

W = Post digestion spike did not meet criteria

S = Reported value determined by the Method of Standard Additions (MSA)

Several ways of defining the limit of detection and quantitation are prevalent in the laboratory industry and may appear in Analytica reports. These include the following:

MRL = "minimum reporting level", from the EPA Safe Drinking Water program (SDW)

PQL = "practical quantitation limit", from SW-846

EQL = "estimated quantitation limit", from SW-846

LOQ = "limit of quantitation", from a number of authoritative sources

In Analytica's work, all of these terms have the same meaning, equivalent to the EPA definition of the MRL. This reporting level is supported by a satisfactory calibration data point which is at that level or lower, and also is supported by a method detection limit (MDL) determined by the procedure in 40CFR. The MDL is lower than the MRL and represents an estimate of the level where positive detections have a 99% probability of being real, but where quantitation accuracy is unknown.

The MRL as defined by Analytica is the lowest demonstrated point of known quantitation accuracy.

The MRL should not be confused with the MCL, which is the EPA-defined "maximum contaminant level" allowed for certain regulated targets under specific regulations, such as the National Primary Drinking Water Regulations. Normally, the MRL is set at a level which is much lower than the MCL in order to ensure that levels are well below those limits. Not all target analytes have MCL levels established.

Other Flags may be applied. See Case Narrative for Description

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702099

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

### REPORTING CONVENTIONS FOR THIS REPORT

B0702099

| <u>TestPkgName</u>                   | <u>Basis</u>     | <u># Sig Figs</u> | <u>Reporting Limit</u>          |
|--------------------------------------|------------------|-------------------|---------------------------------|
| 8015/5030B (Solid) - GRO             | Dry Weight Basis | 2                 | Report to PQL                   |
| 8015B/3550B (Solid) - DRO            | Dry Weight Basis | 2                 | Report to PQL                   |
| 8021/5030B (Solid) - BTEX            | Dry Weight Basis | 2                 | Report to PQL                   |
| ASTMD2216/ASTMD2216 (Solid) - Pmoist | As Received      | 3                 | Report to MDL, J qual below PQL |

# Analytica Chain of Custody Form

|                                                          |                                                                  |                                                               |                                                              |
|----------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|
| 54335 Shaune Drive<br>Juneau, AK 99801<br>(907) 780-6668 | 5761 Silverado Way, # N<br>Anchorage, AK 99518<br>(907) 258-2155 | 3330 Industrial Ave.<br>Fairbanks, AK 99701<br>(907) 456-3116 | 12189 Pennsylvania St<br>Thomton, CT 80241<br>(303) 489-8888 |
| (907) 780-9670 fax                                       | (907) 259-6834 fax                                               | (907) 456-3125 fax                                            | (303) 465-5254 fax                                           |

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**Chain of Custody No:**

[illegible]

# Cooler Receipt Form



Client: Waste Engineering, Inc.  
Project: RFTA-GWS

Client Code: 022120

Order #: B0702099

Cooler ID: 1

**A. Preliminary Examination Phase:**

Date cooler opened: 2/10/2007  
Cooler opened by: LQ

Signature: [Signature]

1. Was airbill Attached? Yes

Airbill #: 852537190230

Carrier Name: FedEx

2. Custody Seals? N/A

How many? 0 Location:

Seal Name:

3. Seals intact? Yes

4. COC Attached? Yes

Properly Completed? Yes

Signed by AEL employee? Yes

5. Project Identification from custody paper: RFTA-GWS

6. Preservative: BlueGel

Temperature: 4.6

Designated person initial here to acknowledge receipt:

[Signature] Date: 2/10/07

COMMENTS:

**B. Log-In Phase:** Samples Log-In Date: 2/12/2007 Log-In By: LQ

1. Packing Type: Bubblewrap

2. Were samples in separate bags? N/A

3. Were containers intact? Yes

Labels agree with COC? Yes

4. Number of bottles received: 4

Number of samples received: 2

5. Correct containers used? Yes

Correct preservatives added? N/A

6. Sufficient sample volume? Yes

7. Bubbles in VOA samples? N/A

8. Was Project manager called and status discussed? No

9. Was anyone called? No Who was called? \_\_\_\_\_ By whom? \_\_\_\_\_ Date: \_\_\_\_\_

COMMENTS:



Analytica Environmental  
Laboratories, Inc.  
12189 Pennsylvania Street  
Thornton, CO 80241  
Phone: 303-469-8868  
Fax: 303-469-5254

2/27/2007

Waste Engineering, Inc.  
P.O. Box 219  
Glenwood Springs, CO 81602  
Attn: Craig Heydenberk

Work Order #: B0702146  
Date: 2/27/2007  
Work ID: RFTA-GWS  
Date Received: 2/10/2007  
Proj #: none

#### Sample Identification

| Lab Sample Number | Client Description | Lab Sample Number | Client Description |
|-------------------|--------------------|-------------------|--------------------|
| B0702146-01       | Diesel Tank        |                   |                    |

Enclosed are the analytical results for the submitted sample(s). Please review the CASE NARRATIVE for a discussion of any data and/or quality control issues. Listings of data qualifiers, analytical codes, key dates, and QC relationships are provided at the end of the report.

Sincerely,

Joseph Egry  
Project Manager

*"The Science of Analysis, The Art of Service"*



## Case Narrative

Analytica Environmental Laboratories, Inc.

Work Order: B0702146

Samples were prepared and analyzed according to EPA or equivalent methods outlined in the following references:

Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures, ASTM D 2216-80, July 1980.

Test Methods for Evaluating Solid Waste, USEPA SW-846, Third Edition, Revision 4, December 1996.

### REVIEW FOR COMPLIANCE WITH ANALYTICA QA PLAN

A summary of our review is shown below, organized by test:

#### SAMPLE RECEIPT:

One sample was received at a temperature of 4.6 deg C at Analytica-Thornton on 2/10/2007 12:00:00 PM. The sample was received in good condition and in order per chain of custody.

Test Method: ASTM D2216 - Pmoist - Solid

All method criteria was met for this test.

Test Method: SW8270C - Semivolatile Organics by GC/MS - PAH - Solid

#### HOLDING TIMES:

Holding times were met for this Test

#### SAMPLE PREPARATION ISSUES AND OBSERVATIONS:

There were no unusual observations.

#### INSTRUMENT PERFORMANCE CHECKS:

Instrument checks were within method criteria.

#### INITIAL CALIBRATIONS:

Initial calibrations were within method criteria.

#### OPENING CONTINUING CALIBRATIONS:

One of the targets show %D values greater than 20% in the opening CCV shown below. The CCC's and the SPCC's are in control. The average %D in the CCV is less than 15%. Thus this CCV meets criteria.

| RunDate              | Data File  | Analyte              | Recovery | LCL | UCL |
|----------------------|------------|----------------------|----------|-----|-----|
| 2/23/2007 1:56:00 PM | 07022303.D | Benzo(g,h,i)perylene | 120.     | 80  | 120 |

#### CLOSING CONTINUING CALIBRATIONS:

There is a CCC out of limits in the closing CCV, as shown below. SW-846 does not require that closing CCVs meet criteria for internal standard analytical methods such as these. The calibration standard information is included to indicate the degree of analytical system degradation caused by the analysis of the samples. There are no negative consequences for data usability.

| RunDate               | Data File  | Analyte                | Recovery | LCL | UCL |
|-----------------------|------------|------------------------|----------|-----|-----|
| 2/23/2007 11:58:00 PM | 07022320.D | Benzo(g,h,i)perylene   | 136.     | 80  | 120 |
| 2/23/2007 11:58:00 PM | 07022320.D | Dibenzo(a,h)anthracene | 136      | 80  | 120 |
| 2/23/2007 11:58:00 PM | 07022320.D | Fluoranthene           | -C 78.1  | 80  | 120 |

## Case Narrative

Analytica Environmental Laboratories, Inc.

Work Order: B0702146

(continued)

2/23/2007 11:58:00 PM 07022320.D Indeno(1,2,3-cd)pyrene 133. 80 120

### INTERNAL STANDARD AREAS:

There were no Internal Standard outliers.

### SURROGATE RECOVERIES:

There were no surrogate outliers.

### METHOD BLANK OUTLIERS:

There are no method blank outliers.

### LCS OUTLIERS:

The LCS and LCSD shown below have one of the targets outside of control windows. These are high recoveries and Acenaphthylene is not detected in associated samples.

| Type | BatchNumber | Analyte        | Recovery | LCL | UCL | Status   |
|------|-------------|----------------|----------|-----|-----|----------|
| LCS  | T070222002  | Acenaphthylene | 160.     | 48  | 133 | Complete |
| LCSD | T070222002  | Acenaphthylene | 168.     | 48  | 133 | Complete |

### MS/MSD and DUP OUTLIERS:

The matrix spike and matrix spike duplicate recoveries shown below indicates a laboratory bias when considered with the LCS/LCSD recoveries shown above. In this case, the recoveries are elevated, and target is not detected in associated samples. Since the bias is high and target is not observed, the results are considered to be fully usable.

| Type | Client Sample | LabSample    | Analyte        | Recovery | LCL | UCL | Parent | Spike |
|------|---------------|--------------|----------------|----------|-----|-----|--------|-------|
| MS   | Diesel Tank   | B0702146-01A | Acenaphthylene | 171      | 48  | 133 | 0.00   | 1760  |
| MSD  | Diesel Tank   | B0702146-01A | Acenaphthylene | 178      | 48  | 133 | 0.00   | 1760  |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

## Report Section: Client Sample Report

Client Sample Name: Diesel Tank

Matrix: Soil

Collection Date: 2/8/2007 9:30:00AM

The following test was conducted by: Analytica - Thornton

Lab Sample Number: B0702146-01A

Prep Date: 2/22/2007

Analytical Method ID: SW8270C - Semivolatile Organics by GC/MS - PAH

Prep Method ID: 3550B

Prep Batch Number: T070222002

Report Basis: Dry Weight Basis

Sample prep wt./vol: 30.00 g

Analysis Date: 2/23/2007 4:19:00PM

Instrument: MS2BNA

File Name: 07022307.D

Dilution Factor: 1

Percent Moisture: 5.14

Analyst Initials: jk

Prep Extract Vol: 2.00 ml

| <u>Analyte</u>         | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>POL</u> | <u>MDL</u> | <u>run #:</u> |                |            |            |               |
|------------------------|--------------|---------------|--------------|--------------|------------|------------|---------------|----------------|------------|------------|---------------|
| Acenaphthene           | 83-32-9      | ND            |              | ug/Kg        | 180        | 27         | 1             |                |            |            |               |
| Acenaphthylene         | 208-96-8     | ND            |              | ug/Kg        | 180        | 30         |               |                |            |            |               |
| Anthracene             | 120-12-7     | ND            |              | ug/Kg        | 180        | 28         |               |                |            |            |               |
| Benzo(a)anthracene     | 56-55-3      | ND            |              | ug/Kg        | 180        | 18         |               |                |            |            |               |
| Benzo(a)pyrene         | 50-32-8      | ND            |              | ug/Kg        | 180        | 20         |               |                |            |            |               |
| Benzo(b)fluoranthene   | 205-99-2     | ND            |              | ug/Kg        | 180        | 24         |               |                |            |            |               |
| Benzo(g,h,i)perylene   | 191-24-2     | ND            |              | ug/Kg        | 180        | 54         |               |                |            |            |               |
| Benzo(k)fluoranthene   | 207-08-9     | ND            |              | ug/Kg        | 180        | 41         |               |                |            |            |               |
| Chrysene               | 218-01-9     | ND            |              | ug/Kg        | 180        | 19         |               |                |            |            |               |
| Dibenzo(a,h)anthracene | 53-70-3      | ND            |              | ug/Kg        | 180        | 54         |               |                |            |            |               |
| Fluoranthene           | 206-44-0     | ND            |              | ug/Kg        | 180        | 22         |               |                |            |            |               |
| Fluorene               | 86-73-7      | ND            |              | ug/Kg        | 180        | 26         |               |                |            |            |               |
| Indeno(1,2,3-cd)pyrene | 193-39-5     | ND            |              | ug/Kg        | 180        | 49         |               |                |            |            |               |
| Naphthalene            | 91-20-3      | 1,900         |              | ug/Kg        | 180        | 21         |               |                |            |            |               |
| Phenanthrene           | 85-01-8      | 70            | J            | ug/Kg        | 180        | 21         |               |                |            |            |               |
| Pyrene                 | 129-00-0     | ND            |              | ug/Kg        | 180        | 29         |               |                |            |            |               |
| <u>Surrogate</u>       | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>POL</u> | <u>MDL</u> | <u>Spike</u>  | <u>% Recov</u> | <u>LCL</u> | <u>UCL</u> | <u>run #:</u> |
| 2-Fluorobiphenyl       | 321-60-8     | 3,000         |              | ug/Kg        | 180        | 21         | 3,500         | 85.8           | 36         | 121        | 1             |
| D14-Terphenyl          | 92-94-4D     | 3,200         |              | ug/Kg        | 180        | 21         | 3,500         | 89.8           | 30         | 134        |               |
| D5-Nitrobenzene        | 98-95-3D     | 3,000         |              | ug/Kg        | 180        | 27         | 3,500         | 85.7           | 30         | 122        |               |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

## Report Section: Method Blank Report

Client Sample Name:

MB

Matrix: Solid

Collection Date: 2/22/2007 9:07:00AM

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T070222002-MB

Prep Date: 2/22/2007

Analytical Method ID: SW8270C - Semivolatile Organics by GC/MS - PAH

Prep Method ID: 3550B

Prep Batch Number: T070222002

Report Basis: As Received

Sample prep wt./vol: 30.00 g

Analysis Date: 2/23/2007 2:32:00PM

Instrument: MS2BNA

File Name: 07022304.D

Dilution Factor: 1

Percent Moisture: NA

Analyst Initials: jk

Prep Extract Vol: 2.00 ml

| <u>Analyte</u>         | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> | <u>run #:</u> |                |            |            |               |
|------------------------|--------------|---------------|--------------|--------------|------------|------------|---------------|----------------|------------|------------|---------------|
| Acenaphthene           | 83-32-9      | ND            |              | ug/Kg        | 170        | 26         | 1             |                |            |            |               |
| Acenaphthylene         | 208-96-8     | ND            |              | ug/Kg        | 170        | 28         |               |                |            |            |               |
| Anthracene             | 120-12-7     | ND            |              | ug/Kg        | 170        | 26         |               |                |            |            |               |
| Benzo(a)anthracene     | 56-55-3      | ND            |              | ug/Kg        | 170        | 17         |               |                |            |            |               |
| Benzo(a)pyrene         | 50-32-8      | ND            |              | ug/Kg        | 170        | 19         |               |                |            |            |               |
| Benzo(b)fluoranthene   | 205-99-2     | ND            |              | ug/Kg        | 170        | 23         |               |                |            |            |               |
| Benzo(g,h,i)perylene   | 191-24-2     | ND            |              | ug/Kg        | 170        | 51         |               |                |            |            |               |
| Benzo(k)fluoranthene   | 207-08-9     | ND            |              | ug/Kg        | 170        | 39         |               |                |            |            |               |
| Chrysene               | 218-01-9     | ND            |              | ug/Kg        | 170        | 18         |               |                |            |            |               |
| Dibenzo(a,h)anthracene | 53-70-3      | ND            |              | ug/Kg        | 170        | 52         |               |                |            |            |               |
| Fluoranthene           | 206-44-0     | ND            |              | ug/Kg        | 170        | 21         |               |                |            |            |               |
| Fluorene               | 86-73-7      | ND            |              | ug/Kg        | 170        | 25         |               |                |            |            |               |
| Indeno(1,2,3-cd)pyrene | 193-39-5     | ND            |              | ug/Kg        | 170        | 47         |               |                |            |            |               |
| Naphthalene            | 91-20-3      | ND            |              | ug/Kg        | 170        | 20         |               |                |            |            |               |
| Phenanthrene           | 85-01-8      | ND            |              | ug/Kg        | 170        | 20         |               |                |            |            |               |
| Pyrene                 | 129-00-0     | ND            |              | ug/Kg        | 170        | 28         |               |                |            |            |               |
| <u>Surrogate</u>       | <u>CASNo</u> | <u>Result</u> | <u>Flags</u> | <u>Units</u> | <u>PQL</u> | <u>MDL</u> | <u>Spike</u>  | <u>% Recov</u> | <u>LCL</u> | <u>UCL</u> | <u>run #:</u> |
| 2-Fluorobiphenyl       | 321-60-8     | 2,700         |              | ug/Kg        | 170        | 20         | 3,300         | 82.0           | 36         | 121        | 1             |
| D14-Terphenyl          | 92-94-4D     | 3,100         |              | ug/Kg        | 170        | 20         | 3,300         | 94.4           | 30         | 134        |               |
| D5-Nitrobenzene        | 98-95-3D     | 2,700         |              | ug/Kg        | 170        | 25         | 3,300         | 82.0           | 30         | 122        |               |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): B0702146

Project: RFTA-GWS

Project Number:

Prep Batch: T070222002

## QUALITY CONTROL REPORT

### LCS/LCSD REPORT

Analysis: SW8270C - Semivolatile Organics by GC/MS - PAH

MB: T070222002-MB

Prep Date: 2/22/2007

MB Anal. Date: 2/23/2007 2:32:00PM

Units: ug/Kg

LCS Anal. Date: 2/23/2007 3:07:00PM LCSD Anal. Date: 2/23/2007 3:43:00PM Matrix: Solid

| Analyte Name           | SampResult | LCSRes. | SDRes. | SPLev | SPDLev | Recov. | SD Recov | RPD  | Recov Lim | RPDLim | Flag         |
|------------------------|------------|---------|--------|-------|--------|--------|----------|------|-----------|--------|--------------|
| Naphthalene            | ND         | 1,360   | 1,450  | 1,670 | 1,670  | 81.6   | 87.0     | 6.4  | 45 - 136  | 40     |              |
| Acenaphthylene         | ND         | 2,670   | 2,810  | 1,670 | 1,670  | 160.2  | 168.6    | 5.1  | 48 - 133  | 40     | high,highdup |
| Acenaphthene           | ND         | 1,420   | 1,510  | 1,670 | 1,670  | 85.2   | 90.6     | 6.1  | 43 - 122  | 40     |              |
| Fluorene               | ND         | 1,430   | 1,530  | 1,670 | 1,670  | 85.8   | 91.8     | 6.8  | 58 - 130  | 40     |              |
| Phenanthrene           | ND         | 1,570   | 1,640  | 1,670 | 1,670  | 94.2   | 98.4     | 4.4  | 54 - 140  | 40     |              |
| Anthracene             | ND         | 1,590   | 1,660  | 1,670 | 1,670  | 95.4   | 99.6     | 4.3  | 59 - 131  | 40     |              |
| Fluoranthene           | ND         | 1,690   | 1,870  | 1,670 | 1,670  | 101.4  | 112.2    | 10.1 | 51 - 140  | 40     |              |
| Pyrene                 | ND         | 1,710   | 1,600  | 1,670 | 1,670  | 102.6  | 96.0     | 6.6  | 40 - 127  | 40     |              |
| Benzo(a)anthracene     | ND         | 1,690   | 1,760  | 1,670 | 1,670  | 101.4  | 105.6    | 4.1  | 58 - 118  | 40     |              |
| Chrysene               | ND         | 1,630   | 1,710  | 1,670 | 1,670  | 97.8   | 102.6    | 4.8  | 55 - 139  | 40     |              |
| Benzo(b)fluoranthene   | ND         | 1,190   | 1,320  | 1,670 | 1,670  | 71.4   | 79.2     | 10.4 | 41 - 133  | 40     |              |
| Benzo(k)fluoranthene   | ND         | 1,360   | 1,480  | 1,670 | 1,670  | 81.6   | 88.8     | 8.5  | 49 - 138  | 40     |              |
| Benzo(a)pyrene         | ND         | 1,340   | 1,420  | 1,670 | 1,670  | 80.4   | 85.2     | 5.8  | 40 - 138  | 40     |              |
| Indeno(1,2,3-cd)pyrene | ND         | 1,480   | 1,310  | 1,670 | 1,670  | 88.8   | 78.6     | 12.2 | 48 - 125  | 40     |              |
| Dibenzo(a,h)anthracene | ND         | 1,570   | 1,410  | 1,670 | 1,670  | 94.2   | 84.6     | 10.7 | 50 - 129  | 40     |              |
| Benzo(g,h,i)perylene   | ND         | 1,490   | 1,250  | 1,670 | 1,670  | 89.4   | 75.0     | 17.5 | 50 - 125  | 40     |              |

### MS/MSD REPORT

Analysis: SW8270C - Semivolatile Organics by GC/MS - PAH

Parent: B0702146-01A

Prep Date: 2/22/2007

Samp. Anal. Date: 2/23/2007 4:19:00PM

Units: ug/Kg

MS Anal. Date: 2/23/2007 5:30:00PM MSD Anal. Date: 2/23/2007 6:41:00PM Matrix: Soil

| Analyte Name   | SampResult | MSRes. | MSDRes | SPLev | SPDLev | Recov. | MSD Rec. | RPD | Recov Lim | RPDLim | Flag          |
|----------------|------------|--------|--------|-------|--------|--------|----------|-----|-----------|--------|---------------|
| Naphthalene    | 1,890      | 3,850  | 4,150  | 1,760 | 1,760  | 111.5  | 128.7    | 7.5 | 45 - 136  | 40     |               |
| Acenaphthylene | ND         | 3,010  | 3,120  | 1,760 | 1,760  | 171.3  | 177.6    | 3.6 | 48 - 133  | 40     | highMShighMSD |
| Acenaphthene   | ND         | 1,650  | 1,710  | 1,760 | 1,760  | 93.9   | 97.4     | 3.6 | 43 - 122  | 40     |               |
| Fluorene       | ND         | 1,560  | 1,670  | 1,760 | 1,760  | 88.8   | 95.1     | 6.8 | 58 - 130  | 40     |               |
| Phenanthrene   | 70.3       | 1,600  | 1,670  | 1,760 | 1,760  | 87.0   | 91.1     | 4.3 | 54 - 140  | 40     |               |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): B0702146

Project: RFTA-GWS

Project Number:

Prep Batch: T070222002

## QUALITY CONTROL REPORT

### MS/MSD REPORT

Analysis: SW8270C - Semivolatile Organics by GC/MS - PAH

Parent: B0702146-01A

Prep Date: 2/22/2007

Samp. Anal. Date: 2/23/2007 4:19:00PM

Units: ug/Kg

MS Anal. Date: 2/23/2007 5:30:00PM MSD Anal. Date: 2/23/2007 6:41:00PM Matrix: Soil

| Analyte Name           | SampResult | MSRes. | MSDRes | SPLev | SPDLev | Recov. | MSD Rec. | RPD  | Recov Lim | RPDLim | Flag |
|------------------------|------------|--------|--------|-------|--------|--------|----------|------|-----------|--------|------|
| Anthracene             | ND         | 1,570  | 1,700  | 1,760 | 1,760  | 89.3   | 96.8     | 8.0  | 59 - 131  | 40     |      |
| Fluoranthene           | ND         | 1,240  | 1,610  | 1,760 | 1,760  | 70.6   | 91.7     | 26.0 | 51 - 140  | 40     |      |
| Pyrene                 | ND         | 1,160  | 1,290  | 1,760 | 1,760  | 66.0   | 73.4     | 10.6 | 46 - 135  | 40     |      |
| Benzo(a)anthracene     | ND         | 1,660  | 1,730  | 1,760 | 1,760  | 94.5   | 98.5     | 4.1  | 58 - 118  | 40     |      |
| Chrysene               | ND         | 1,520  | 1,620  | 1,760 | 1,760  | 86.5   | 92.2     | 6.4  | 55 - 139  | 40     |      |
| Benzo(b)fluoranthene   | ND         | 1,230  | 1,320  | 1,760 | 1,760  | 70.0   | 75.2     | 7.1  | 41 - 133  | 40     |      |
| Benzo(k)fluoranthene   | ND         | 1,370  | 1,270  | 1,760 | 1,760  | 78.0   | 72.3     | 7.6  | 49 - 138  | 40     |      |
| Benzo(a)pyrene         | ND         | 1,320  | 1,360  | 1,760 | 1,760  | 75.1   | 77.4     | 3.0  | 40 - 138  | 40     |      |
| Indeno(1,2,3-cd)pyrene | ND         | 1,450  | 1,650  | 1,760 | 1,760  | 82.5   | 93.9     | 12.9 | 48 - 125  | 40     |      |
| Dibenzo(a,h)anthracene | ND         | 1,610  | 1,820  | 1,760 | 1,760  | 91.6   | 103.6    | 12.2 | 50 - 129  | 40     |      |
| Benzo(g,h,i)perylene   | ND         | 1,480  | 1,690  | 1,760 | 1,760  | 84.2   | 96.2     | 13.2 | 50 - 125  | 40     |      |

### FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.



## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

### SURROGATE RECOVERY SUMMARY REPORT

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Test Method: SW8270C - Semivolatile Organics by GC/MS - PAH

Lab Sample #: B0702146-01A Dilution: 1  
Analysis Date: 2/23/2007 4:19:00PM Client Sample: Diesel Tank  
Batch Number: T070222002 Data File: 07022307.D

| AnalyteName      | SSRecov | LCL | UCL | SSFlag | Result Status |
|------------------|---------|-----|-----|--------|---------------|
| 2-Fluorobiphenyl | 86      | 36  | 121 |        | Complete      |
| D14-Terphenyl    | 90      | 30  | 134 |        | Complete      |
| D5-Nitrobenzene  | 86      | 30  | 122 |        | Complete      |

Lab Sample #: B0702146-01A Dilution: 10  
Analysis Date: 2/23/2007 4:54:00PM Client Sample: Diesel Tank  
Batch Number: T070222002 Data File: 07022308.D

| AnalyteName      | SSRecov | LCL | UCL | SSFlag | Result Status |
|------------------|---------|-----|-----|--------|---------------|
| 2-Fluorobiphenyl | 79      | 36  | 121 |        | Confirm       |
| D14-Terphenyl    | 111     | 30  | 134 |        | Confirm       |
| D5-Nitrobenzene  | 104     | 30  | 122 |        | Confirm       |

Lab Sample #: T070222002-MB Dilution: 1  
Analysis Date: 2/23/2007 2:32:00PM Client Sample: MB  
Batch Number: T070222002 Data File: 07022304.D

| AnalyteName      | SSRecov | LCL | UCL | SSFlag | Result Status |
|------------------|---------|-----|-----|--------|---------------|
| 2-Fluorobiphenyl | 82      | 36  | 121 |        | Complete      |
| D14-Terphenyl    | 94      | 30  | 134 |        | Complete      |
| D5-Nitrobenzene  | 82      | 30  | 122 |        | Complete      |

Lab Sample #: T070222002-LCS Dilution: 1  
Analysis Date: 2/23/2007 3:07:00PM Client Sample: LCS  
Batch Number: T070222002 Data File: 07022305.D

| AnalyteName      | SSRecov | LCL | UCL | SSFlag | Result Status |
|------------------|---------|-----|-----|--------|---------------|
| 2-Fluorobiphenyl | 90      | 36  | 121 |        | Complete      |
| D14-Terphenyl    | 132     | 30  | 134 |        | Complete      |
| D5-Nitrobenzene  | 89      | 30  | 122 |        | Complete      |

Lab Sample #: T070222002-LCSD Dilution: 1  
Analysis Date: 2/23/2007 3:43:00PM Client Sample: LCSD  
Batch Number: T070222002 Data File: 07022306.D

| AnalyteName      | SSRecov | LCL | UCL | SSFlag | Result Status |
|------------------|---------|-----|-----|--------|---------------|
| 2-Fluorobiphenyl | 93      | 36  | 121 |        | Complete      |
| D14-Terphenyl    | 123     | 30  | 134 |        | Complete      |
| D5-Nitrobenzene  | 90      | 30  | 122 |        | Complete      |

Lab Sample #: B0702146-01A-MS Dilution: 1  
Analysis Date: 2/23/2007 5:30:00PM Client Sample: MS  
Batch Number: T070222002 Data File: 07022309.D

| AnalyteName      | SSRecov | LCL | UCL | SSFlag | Result Status |
|------------------|---------|-----|-----|--------|---------------|
| 2-Fluorobiphenyl | 88      | 36  | 121 |        | Complete      |
| D14-Terphenyl    | 90      | 30  | 134 |        | Complete      |
| D5-Nitrobenzene  | 80      | 30  | 122 |        | Complete      |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

Test Method: SW8270C - Semivolatile Organics by GC/MS - PAH

Lab Sample #: B0702146-01A-MS

Dilution: 10

Analysis Date: 2/23/2007 6:06:00PM

Client Sample: MS

Batch Number: T070222002

Data File: 07022310.D

| <u>AnalyteName</u> | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|--------------------|----------------|------------|------------|---------------|----------------------|
| 2-Fluorobiphenyl   | 79             | 36         | 121        |               | Rrun                 |
| D14-Terphenyl      | 105            | 30         | 134        |               | Rrun                 |
| D5-Nitrobenzene    | 107            | 30         | 122        |               | Rrun                 |

Lab Sample #: B0702146-01A-MSD

Dilution: 1

Analysis Date: 2/23/2007 6:41:00PM

Client Sample: MSD

Batch Number: T070222002

Data File: 07022311.D

| <u>AnalyteName</u> | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|--------------------|----------------|------------|------------|---------------|----------------------|
| 2-Fluorobiphenyl   | 87             | 36         | 121        |               | Complete             |
| D14-Terphenyl      | 91             | 30         | 134        |               | Complete             |
| D5-Nitrobenzene    | 110            | 30         | 122        |               | Complete             |

Lab Sample #: B0702146-01A-MSD

Dilution: 10

Analysis Date: 2/23/2007 7:16:00PM

Client Sample: MSD

Batch Number: T070222002

Data File: 07022312.D

| <u>AnalyteName</u> | <u>SSRecov</u> | <u>LCL</u> | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
|--------------------|----------------|------------|------------|---------------|----------------------|
| 2-Fluorobiphenyl   | 81             | 36         | 121        |               | Rrun                 |
| D14-Terphenyl      | 100            | 30         | 134        |               | Rrun                 |
| D5-Nitrobenzene    | 99             | 30         | 122        |               | Rrun                 |

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146  
Project: RFTA-GWS  
Client: Waste Engineering, Inc.  
Client Project Number: none

### QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 68,889 Lab Project Number: B0702146

Prep Date: 2/22/2007

Lab Method Blank Id: T070222002-MB

Prep Batch ID: T070222002

Method: SW8270C - Semivolatile Organics by GC/MS - PAH

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u> |
|------------------|-------------------------|-----------------|---------------------|
| T070222002-LCS   | LCS                     | 07022305.D      | 2/23/2007 3:07:00PM |
| T070222002-LCSD  | LCSD                    | 07022306.D      | 2/23/2007 3:43:00PM |
| B0702146-01A     | Diesel Tank             | 07022307.D      | 2/23/2007 4:19:00PM |
| B0702146-01A-MS  | MS                      | 07022309.D      | 2/23/2007 5:30:00PM |
| B0702146-01A-MSD | MSD                     | 07022311.D      | 2/23/2007 6:41:00PM |

Prep Date: 2/22/2007

Lab Method Blank Id: T070223001-MB

Prep Batch ID: T070223001

Method: ASTM D2216 - Pmoist

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u> |
|------------------|-------------------------|-----------------|---------------------|
| B0702112-04A     | Batch QC                |                 | 2/22/2007 3:30:00PM |
| B0702146-01A     | Diesel Tank             |                 | 2/22/2007 3:30:00PM |
| B0702112-04A-DUP | DUP                     |                 | 2/22/2007 3:30:00PM |

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

### DATA FLAGS AND DEFINITIONS

The PQL is the Method Quantitation Limit as defined by USACE.

Reporting Limit: Limit below which results are shown as "ND". This may be the PQL, MDL, or a value between. See the report conventions below.

#### Result Field:

ND = Not Detected at or above the Reporting Limit

NA = Analyte not applicable (see Case Narrative for discussion)

#### Qualifier Fields:

LOW = Recovery is below Lower Control Limit

HIGH = Recovery, RPD, or other parameter is above Upper Control Limit

E = Reported concentration is above the instrument calibration upper range

#### Organic Analysis Flags:

B = Analyte was detected in the laboratory method blank

J = Analyte was detected above MDL or Reporting Limit but below the Quant Limit (PQL)

#### Inorganic Analysis Flags:

J = Analyte was detected above the Reporting Limit but below the Quant Limit (PQL)

W = Post digestion spike did not meet criteria

S = Reported value determined by the Method of Standard Additions (MSA)

Several ways of defining the limit of detection and quantitation are prevalent in the laboratory industry and may appear in Analytica reports. These include the following:

MRL = "minimum reporting level", from the EPA Safe Drinking Water program (SDW)

PQL = "practical quantitation limit", from SW-846

EQL = "estimated quantitation limit", from SW-846

LOQ = "limit of quantitation", from a number of authoritative sources

In Analytica's work, all of these terms have the same meaning, equivalent to the EPA definition of the MRL. This reporting level is supported by a satisfactory calibration data point which is at that level or lower, and also is supported by a method detection limit (MDL) determined by the procedure in 40CFR. The MDL is lower than the MRL and represents an estimate of the level where positive detections have a 99% probability of being real, but where quantitation accuracy is unknown.

The MRL as defined by Analytica is the lowest demonstrated point of known quantitation accuracy.

The MRL should not be confused with the MCL, which is the EPA-defined "maximum contaminant level" allowed for certain regulated targets under specific regulations, such as the National Primary Drinking Water Regulations. Normally, the MRL is set at a level which is much lower than the MCL in order to ensure that levels are well below those limits. Not all target analytes have MCL levels established.

Other Flags may be applied. See Case Narrative for Description

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0702146

Project: RFTA-GWS

Client: Waste Engineering, Inc.

Client Project Number: none

### REPORTING CONVENTIONS FOR THIS REPORT

B0702146

| <u>TestPkgName</u>                   | <u>Basis</u>     | <u># Sig Figs</u> | <u>Reporting Limit</u>          |
|--------------------------------------|------------------|-------------------|---------------------------------|
| 8270C/3550B (Solid) - PAH            | Dry Weight Basis | 2                 | Report to MDL, J qual below PQL |
| ASTMD2216/ASTMD2216 (Solid) - Pmoist | As Received      | 3                 | Report to MDL, J qual below PQL |





# Cooler Receipt Form



Client: Waste Engineering, Inc.  
Project: RFTA-GWS

Client Code: 022120

Order #: B0702146

Cooler ID: 1

A. Preliminary Examination Phase:

Date cooler opened: 2/10/2007  
Cooler opened by: LQ

Signature: 

1. Was airbill Attached? Yes

Airbill #: 852537190230

Carrier Name: FedEx

2. Custody Seals? N/A

How many? 0 Location:

Seal Name:

3. Seals intact? Yes

4. COC Attached? Yes

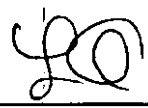
Properly Completed? Yes

Signed by AEL employee? Yes

5. Project Identification from custody paper: RFTA-GWS

6. Preservative: BlueGel

Temperature: 4.6

Designated person initial here to acknowledge receipt: 

Date: 2/10/07

COMMENTS:

B. Log-In Phase: Samples Log-in Date: 2/12/2007 Log-in By: LQ

1. Packing Type: Bubblewrap

2. Were samples in separate bags? N/A

3. Were containers intact? Yes

Labels agree with COC? Yes

4. Number of bottles received: 1

Number of samples received: 1

5. Correct containers used? Yes

Correct preservatives added? N/A

6. Sufficient sample volume? Yes

7. Bubbles in VOA samples? N/A

8. Was Project manager called and status discussed? No

9. Was anyone called? No Who was called? \_\_\_\_\_ By whom? \_\_\_\_\_ Date: \_\_\_\_\_

COMMENTS:

**APPENDIX E - BOREHOLE LITHOLOGIC LOGS  
AND WELL COMPLETION**

Soil sampling involving Borings/Direct Push Points has not been performed at the  
Site or Requested by the OPS.

**APPENDIX F - WASTE DISPOSAL MANIFESTS**

Contaminated soil has not been generated at the site. Disposal has not occurred.

**APPENDIX G - SITE CLASSIFICATION CHECKLIST**

A site characterization has not been completed. As a result the site classification tables cannot be completed at this time.

**CLASSIFICATION 1 - CURRENT THREAT TO HUMAN HEALTH , SAFETY, OR SENSITIVE ENVIRONMENT**

|  | R | N | U | SUB | Threat                                                                                                                                                                                                              | Response Action                                                                                                                                                                |
|--|---|---|---|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |   |   |   | 1.1 | Explosive levels, or concentrations of vapors that could cause acute health effects, are present in a residence or other building.                                                                                  | <i>Evacuate occupants, begin emergency abatement measures such as subsurface ventilation, or building pressurization or free product removal. Notify local fire authority.</i> |
|  |   |   |   | 1.2 | Explosive levels of vapors are present in subsurface utility system(s).                                                                                                                                             | <i>Evacuate vicinity immediately, begin emergency abatement measures such as ventilation.</i>                                                                                  |
|  |   |   |   | 1.3 | Free product is present in measurable quantities at ground surface, on surface water bodies, in utilities, or on surface water.                                                                                     | <i>Prevent further free product migration by appropriate containment measures, institute free product removal, restrict area access.</i>                                       |
|  |   |   |   | 1.4 | A water supply well, supply line, or surface intake is impacted** above action levels.                                                                                                                              | <i>Notify user(s) provide alternate water supply, control contaminated water and treat water at the point-of-use.</i>                                                          |
|  |   |   |   | 1.5 | Ambient vapor/particulate concentrations of concern from an acute exposure or safety viewpoint.                                                                                                                     | <i>Install a vapor barrier, remove the source, or restrict access to affected area.</i>                                                                                        |
|  |   |   |   | 1.6 | Surface water, storm water, or groundwater which is impacted** above action levels is discharging directly to a surface water body used for human drinking water or contact recreation, or a sensitive environment. | <i>Minimize extent of impact by containment measures, and implement habitat management to minimize exposures.</i>                                                              |



**CLASSIFICATION 2 - SHORT-TERM THREAT (0-6 MONTHS) TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB | Threat                                                                                                                                                                                                           | Response Action                                                                                                                                    |
|---|---|---|---|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|   |   |   |   | 2.1 | Explosive vapor levels, or concentrations that could cause acute health effects, may accumulate in a residence or other buildings within six months.                                                             | <i>Assess the potential for vapor migration through monitoring/modeling and remove source, if necessary, or install a vapor migration barrier.</i> |
|   |   |   |   | 2.2 | Surficial soils impacted** above action levels, are exposed and less than 500 ft from public access, dwellings, parks, sensitive environment, playgrounds, day care centers, schools, or similar use facilities. | <i>Remove soils, cover area, or restrict access.</i>                                                                                               |
|   |   |   |   | 2.3 | A water supply well producing from the affected groundwater is impacted** above action levels, or is located less than 120 ft* down-gradient of the known extent of contamination.                               | <i>Notify owner/user, evaluate need for point-of-use water treatment, hydraulic control, or alternative water supply.</i>                          |
|   |   |   |   | 2.4 | Groundwater is impacted** above action levels and a water supply well producing from a different interval is within the known extent of contamination.                                                           | <i>Notify owner, monitor groundwater well quality and determine need for prevention of vertical migration to the supply well.</i>                  |
|   |   |   |   | 2.5 | Surface water, storm water, or groundwater, impacted** above action levels, discharges within 500 ft of a surface water body used for human drinking water or contact recreation, or a sensitive environment.    | <i>Begin containment measures. Restrict access to areas near discharge. Evaluate magnitude and impact to discharge area.</i>                       |
|   |   |   |   | 2.6 | Free product, of any measurable thickness on groundwater is discovered.                                                                                                                                          | <i>Prevent free product migration by appropriate containment measures. Begin free product removal immediately.</i>                                 |
|   |   |   |   | 2.7 | Groundwater impacted** above action levels is present offsite.                                                                                                                                                   | <i>Define extent and degree of contamination. Notify OIS of name and address of impacted parties.</i>                                              |

**CLASSIFICATION 2a - INTERMEDIATE-TERM THREAT (7-24 MONTHS) TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB  | Threat                                                                                                                                                                                               | Response Action                                                                                                                                     |
|---|---|---|---|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|   |   |   |   | 2a.1 | Explosive vapor levels, or concentrations that could cause acute health effects may accumulate in a residence or other buildings within seven to twenty four months.                                 | <i>Assess the potential for vapor migration, through monitoring/modeling and remove source, if necessary, or install a vapor migration barrier.</i> |
|   |   |   |   | 2a.2 | Groundwater is impacted** above action levels and a water supply well producing from the impacted interval is located between 120 ft and 500 ft* down-gradient of the known extent of contamination. | <i>Notify owner/user, evaluate need for point-of-use water treatment, hydraulic control, or alternate water supply.</i>                             |

**CLASSIFICATION 3 - LONG-TERM THREAT (>2 YEARS) TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB | Threat                                                                                                                                                                                                      | Response Action                                                                                                                                                                             |
|---|---|---|---|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |   |   |   | 3.1 | Subsurface soils (> 3 ft bgs) are impacted** above action levels, and depth from impacted soils to the first groundwater is less than 50 ft.                                                                | <i>Define the extent of contamination. Monitor groundwater. Determine the potential for future contaminant migration to the groundwater.</i>                                                |
|   |   |   |   | 3.2 | Groundwater is impacted** above action levels onsite with the potential to migrate offsite.                                                                                                                 | <i>Define the extent of contamination. Monitor groundwater. Determine the potential for future contaminant migration to the groundwater at the property boundary.</i>                       |
|   |   |   |   | 3.3 | Groundwater is impacted** above action levels, and water supply wells producing from the impacted interval are located between 500 ft and ½ mile* down gradient of the known extent of contamination.       | <i>Define extent of contamination. Monitor the dissolved plume and evaluate the potential for future contaminant migration, for natural attenuation and the need for hydraulic control.</i> |
|   |   |   |   | 3.4 | Surface water, storm water, or groundwater impacted** above action levels, discharges within 1500 ft of a surface water body used for human drinking water or contact recreation, or sensitive environment. | <i>Investigate potential impact on sensitive environment or surface water body, restrict access to area of discharge and evaluate the need for containment/controls measures.</i>           |

**CLASSIFICATION 4 - NO DEMONSTRABLE LONG-TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB | Threat                                                                                                                                                                                                                                   | Response Action                                                                                     |
|---|---|---|---|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|   |   |   |   | 4.1 | Impacted** soils above action levels are located more than 3 ft bgs and are greater than 50 ft above the nearest groundwater.                                                                                                            | <i>Monitor groundwater and evaluate effect of natural attenuation on leachate migration.</i>        |
|   |   |   |   | 4.2 | Groundwater is impacted** above action levels and water supply wells that do not produce from the impacted interval are located downgradient outside the known extent of contamination.                                                  | <i>Monitor groundwater and evaluate effect of natural attenuation on dissolved plume migration.</i> |
|   |   |   |   | 4.3 | Surficial soils impacted** above action levels are exposed and greater than 500 ft from public access, dwellings, parks, sensitive environments, sensitive resources, playgrounds, day care centers, schools, or similar use facilities. | <i>Restrict access to affected soils.</i>                                                           |

\* These distances are based on conservative assumptions for groundwater flow velocity. These distances can be adjusted provided supporting documentation is submitted to and approved by the OIS.

\*\*If the extent of contamination has not been defined the owner/operator must assume that all potential POEs are within the impacted area.

## APPENDIX H - SUPPORTING DOCUMENTATION

Reported laboratory results are included in Appendix D.

BILL RITTER, JR.  
Governor

DONALD J. MARES  
Executive Director

RICHARD O. PIPER  
Director of Oil and Public  
Safety



USGAPROA 005  
**DEPARTMENT OF LABOR AND EMPLOYMENT**

**Division of Oil and Public Safety**

**Remediation Section**

633 17<sup>th</sup> Street, Suite 500  
Denver, Colorado 80202-3660  
(303) 318-8500; Fax (303) 318-8546  
Website: <http://oil.cdle.state.co.us>

**FILE COPY**

May 10, 2007

**RUSS DECKER  
ROARING FORK TRANSPORTATION AUTHORITY  
2307 WULFSOHN RD  
GLENWOOD SPRINGS CO 81601**

**Re: Petroleum Storage Tanks (PSTs) at the Roaring Fork Transit Agency, 2307  
Wulfsohn Road, Garfield County, Glenwood Springs, Colorado. Event ID 10241**

**Dear Mr. Decker:**

The Division of Oil and Public Safety (OPS) has reviewed the Site Characterization Report for the above referenced site that was received on April 30, 2007.

Based solely upon the information submitted, which shows that contamination levels are below state cleanup levels, OPS does not require any further investigation or remedial action at this time. If conditions change, OPS reserves the right to determine if any additional actions are necessary. This no further action (NFA) letter is in reference to the release reported on November 1, 2006.

**OPS cannot release you from any liability that may be associated with any contamination at or from this site.**

Please address correspondence regarding this site to me. If you have any questions call me at (303) 318-8532.

Sincerely,

A handwritten signature in black ink, appearing to read "B. Sonnier".

**Bobby J. Sonnier, P.G.  
Environmental Protection Specialist  
Remediation Section**

**cc: Jennifer Steffes, Petroleum Assessment Section Supervisor  
Craig Heydenberk, Waste Engineering, Inc., P.O. Box 219, Glenwood Springs,  
Colorado 81611**

**FACILITY ID#: 15558**

**ROARING FORK TRANSIT AGENCY**

**EVENT ID#: 10428**

**2307 WULFSOHN RD  
GLENWOOD SPRINGS**

**DATE RECEIVED: 10/25/2007**

**REPORT TYPE: SCR - Site Characterization Report Received**

**REVIEWER: Sandoval**

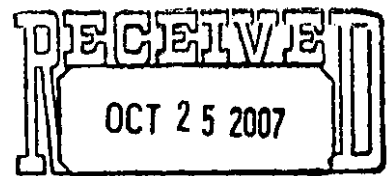
**SARDONYX ID: USGARROA 5**

**COMMENTS:**

# WEI

**Waste Engineering, Inc.**

818 Colorado Avenue, Suite 307, P.O. Box 219  
Glenwood Springs, Colorado 81602  
(970) 945-7755 TEL  
(970) 945-9210 FAX



DIVISION OF OIL AND PUBLIC SAFETY  
e-mail: cheydenberk@wrightwater.com

## FILE COPY

October 22, 2007

**Via First Class Mail**

Mr. Bobby Sonnier  
Colorado Department of Labor and Employment  
Division of Oil and Public Safety  
Remediation Section  
633 17<sup>th</sup> Street, Suite 500  
Denver, CO 80202-3660

Re: Site Characterization Report for Roaring Fork Transportation Authority  
2307 Wulfsohn Rd Glenwood Springs, CO 81601 Facility ID# 15558

10428

Dear Mr. Sonnier:

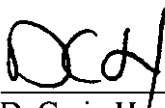
Waste Engineering, Inc. (WEI) is submitting the attached Site Characterization Report (SCR) completed on behalf of Roaring Fork Transportation Authority (RFTA). The data obtained during our investigation is limited. At your request, we obtained one grab sample at a fill dispenser for an underground storage tank (UST) used to store new motor oil. The sample was obtained at approximately 1½ feet below ground surface. The samples were analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), and oil and grease.

Due to the limited data collected at the Site, a majority of the information required in the SCR is not available.

Should you have any questions or require additional information, please do not hesitate to call.

Very truly yours,

WASTE ENGINEERING, INC.

By   
D. Craig Heydenberk  
Senior Environmental Scientist

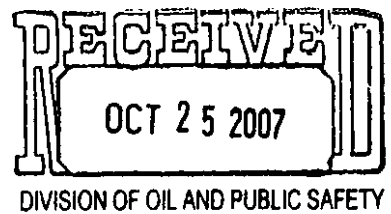
cc: Russ Decker

C:\\_WORK\WEI002-040\020mo\Cover letter\_NewMotorOil.doc

DENVER  
(303) 480-1700 TEL (303) 480-1020 FAX

DURANGO  
(970) 259-7411 TEL (970) 259-8758 FAX





# SITE CHARACTERIZATION REPORT (SCR) FILE COPY

Submit the completed SCR to:

Colorado Department of Labor and Employment  
Oil Inspection Section  
(Technical Reviewer's Name - if known)  
633 17<sup>th</sup> Street, Suite 500  
Denver, CO 80202-3660

This standardized format is required for all SCRs submitted to the Colorado Oil Inspection Section for releases occurring on or after February 1, 1999.

This SCR is intended to replace the Initial Site Characterization Report (ISCR). In addition to the information formerly included in the ISCR, it is required that the SCR define the extent of contamination. The SCR incorporates risk based corrective actions through Tier 1 or Tier 1A, as appropriate to the site. This report must be submitted in duplicate.

## IMPORTANT

**Refer to the OIS Owner/Operator Guidance Document for assistance in report preparation.**

**This report is required to be submitted within 90 days of the release.**

**If contamination has never been detected above Tier 1 and/or MCLs, a No Further Action Request (NFAR) Report may be submitted in place of this SCR.**

# SITE CHARACTERIZATION REPORT

## SITE INFORMATION

|                                                         |                                   |                                                  |
|---------------------------------------------------------|-----------------------------------|--------------------------------------------------|
| Site Name: <b>Roaring Fork Transportation Authority</b> |                                   | Type of Business on Site: <b>Bus Maintenance</b> |
| Site Address: <b>2307 Wulfsohn Road</b>                 |                                   |                                                  |
| City: <b>Glenwood Springs</b>                           | County: <b>Garfield</b>           | Zip Code: <b>81623</b>                           |
| Phone Number: <b>(970) 384-4966</b>                     | Fax Number: <b>(970) 928-8273</b> |                                                  |
| Site Contact Person: <b>Mr. Russ Decker</b>             |                                   |                                                  |

## OWNER/OPERATOR INFORMATION

|                                                    |                                   |                        |
|----------------------------------------------------|-----------------------------------|------------------------|
| Name: <b>Roaring Fork Transportation Authority</b> |                                   |                        |
| Address: <b>0051 Service Center Drive</b>          |                                   |                        |
| City: <b>Aspen</b>                                 | State: <b>Colorado</b>            | Zip Code: <b>81611</b> |
| Phone Number: <b>(970) 384-4966</b>                | Fax Number: <b>(970) 928-8273</b> |                        |
| Contact Person: <b>Mr. Russ Decker</b>             |                                   |                        |

## ENVIRONMENTAL CONSULTANT INFORMATION

|                                            |                                   |                        |
|--------------------------------------------|-----------------------------------|------------------------|
| Name: <b>Waste Engineering, Inc.</b>       |                                   |                        |
| Address: <b>P. O. Box 219</b>              |                                   |                        |
| City: <b>Glenwood Springs</b>              | State: <b>Colorado</b>            | Zip Code: <b>81611</b> |
| Phone Number: <b>(970) 945-7755</b>        | Fax Number: <b>(970) 945-9210</b> |                        |
| Contact Person: <b>D. Craig Heydenberk</b> |                                   |                        |

Date Report was completed: **October 22, 2007**

**INSTRUCTIONS FOR COMPLETING REPORT:** Complete all applicable sections and appendices of this report. If a question does not apply to the site, insert ANA=.

Limit your responses to the suggested space(s). If you are using the computer version of this form, the bracketed number after each question (e.g. [2]) is the number of suggested lines for each answer. Do not use bold type when answering, except as requested in the Tables of the Appendices. Insert rows in tables as needed, and delete any unused rows. Contact the Oil Inspection Section technical assistance line at (303) 318-8547 if you have any questions. The OIS Regulations, Guidance Document, Report Formats, and additional program related information can be found at the Oil Inspection Website at <http://oil.edle.state.co.us>. Call (303) 321-4164 for a copy of the Regulations (commodity # 615-82-44-0899) or the Guidance Document (commodity # 615-82-44-0626).

## SITE CHARACTERIZATION REPORT SUMMARY

What type of product was released? (Check all that apply) Leaded Gasoline \_\_\_ Unleaded Gasoline \_\_\_ Diesel \_\_\_ Waste Oil \_\_\_ Other X - New Motor Oil

Is there evidence of any released hazardous substance on the site? (If this is an AST release and it exceeds the RCRA level for TCLP benzene, it is a hazardous substance.) Yes \_\_\_ No X (check one). If yes, contact the Colorado Department of Public Health and Environment.

Does soil contamination exist? (check all that apply) Onsite X Offsite \_\_\_ If so, what is the vertical extent of soil contamination? From \_\_\_ ft to \_\_\_ ft (unknown). What is the soil type? Pea gravel bedding - Natural soil consists of alluvial silts, clays, and gravels.

Does groundwater contamination exist? (check all that apply) Onsite \_\_\_ Offsite \_\_\_ Unknown X  
The need for a groundwater evaluation has not been established.

Is free product present in the soil or groundwater? Yes \_\_\_ No \_\_\_ Unknown X  
The need for a groundwater evaluation has not been established.

What is the depth to groundwater (in feet)? Based on the difference in elevation between the Site and Colorado River - The depth to groundwater is estimated at 300 feet.

For each category, list the distance from the source to the nearest point of exposure (POE).  
Only list POEs within 1/4 mile of the site.

|               | Property Boundary | Surficial Soils | Subsurface Utilities | Structures | Groundwater Wells | Surface Water | Sensitive Environment |
|---------------|-------------------|-----------------|----------------------|------------|-------------------|---------------|-----------------------|
| Distance (ft) | 125               | 0               | 30                   | 25         | Unknown           | 850           | 850 Colorado River    |

List the highest concentration of the following constituents found

|                            | Benzene  | Toluene | Ethyl Benzene | Xylenes | TVPH | TEPH | TPH | Oil & Grease | Other |
|----------------------------|----------|---------|---------------|---------|------|------|-----|--------------|-------|
| Soil (mg/Kg)               | <0.00051 | <0.001  | <0.001        | 0.0026  | N/A  | N/A  | N/A | 310          | N/A   |
| Water (µg/l)               | N/A      | N/A     | N/A           | N/A     | N/A  | N/A  | N/A | N/A          | NO    |
| Vapor (µg/m <sup>3</sup> ) | N/A      | N/A     | N/A           | N/A     | N/A  | N/A  | N/A | N/A          | NO    |

List the highest concentration of the following constituents remaining on site

|                            | Benzene  | Toluene | Ethyl Benzene | Xylenes | TVPH | TEPH | TPH | Oil & Grease | Other |
|----------------------------|----------|---------|---------------|---------|------|------|-----|--------------|-------|
| Soil (mg/Kg)               | <0.00051 | <0.001  | <0.001        | 0.0026  | N/A  | N/A  | N/A | 310          | N/A   |
| Water (µg/l)               | N/A      | N/A     | N/A           | N/A     | N/A  | N/A  | N/A | N/A          | NO    |
| Vapor (µg/m <sup>3</sup> ) | N/A      | N/A     | N/A           | N/A     | N/A  | N/A  | N/A | N/A          | NO    |

N/A = Not Analyzed

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**A. RELEASE INFORMATION****1. History of this release.**

- a) Date of release (If actual release date is unknown, input the date that the release was first suspected). [1] August 1, 2007
- b) Date that OIS was notified of the suspected release. [1] August 1, 2007
- c) Date that the suspected release was confirmed. [1] August 1, 2007
- d) Date that OIS was notified of the confirmed release. [1] August 1, 2007
- e) Include the location of the release on Figure 1, Appendix C.

**2. How release was discovered.**

- a) Discovered at tank removal or closure in place (yes/no) No
- b) Discovered during subsurface investigation (yes/no) No
- c) Discovered as a result of release detection or system failure (yes/no) No
- d) Impacts discovered at off-site property (yes/no) No
- a) Other (describe) [1] The release was suspected by an OPS Inspector during his observation of replacement of overfill protection. Sampling and analysis of soil samples was requested.

**3. Release description.**

- b) Product(s) released [1] New motor oil.
- c) Quantity released [1] The quantity released is not known but would be limited to quantity released from the original overfill assembly.

**B. SITE HISTORY****1. List known historical uses of the site on the table below.**

| Type of Use and/or Business Name | Begin Date | End Date |
|----------------------------------|------------|----------|
| Bus Maintenance                  | 2002       | current  |
| Previously Undeveloped           |            |          |
|                                  |            |          |

2. Describe any previous releases at the site on the table below. No previous releases are known or have been reported.

| Date of Prior Release | Product | Quantity (gallons) | Source/Cause of Release (Identify location on Fig. 1) | No Further Action Letter Issued? (y/n) (If yes enter date) |
|-----------------------|---------|--------------------|-------------------------------------------------------|------------------------------------------------------------|
| ANA≡                  | ANA≡    | ANA≡               | ANA≡                                                  | ANA≡                                                       |
|                       |         |                    |                                                       |                                                            |

3. If a no further action letter has not been issued for a previous release explain on-going activities [1]. No previous releases are known or have been reported.

### C. RELEASE CONFIRMATION

1. Storage tank removal/closure in place. (Complete Section F-1 to describe tank excavation dimensions, soil laboratory results, etc.).

a) How many tanks were removed or closed in place? [1] No tanks have been removed or closed in place.

b) How many tanks remain on site which are in operation? [1] Two 10,000-gallon tanks remain on site and in operation. The site also includes an 850-gallon UST used to store waste oil. The new motor oil tank is 3,000-gallon.

c) How many tanks remain on site which have not been properly closed in place? 0 - Two 10,000-gallon tanks remain on site and in operation and an 850-gallon tank.

d) List on the table below information concerning tank removal/closure in place. (Tank # as identified on Figure 1 and/or Figure 2, Appendix C).

| Tank # | Date Removed or Closed | Indicate closed in place(I), removed (R) | Tank Condition (corrosion, holes, etc.) | Contamination Suspected? (y/n) | Samples Analyzed? (y/n) |
|--------|------------------------|------------------------------------------|-----------------------------------------|--------------------------------|-------------------------|
| ANA≡   | ANA≡                   | ANA≡                                     | ANA≡                                    | ANA≡                           | ANA≡                    |
|        |                        |                                          |                                         |                                |                         |
|        |                        |                                          |                                         |                                |                         |

- b) Were tank removal or closure in place activities performed in accordance with API recommended practice 1604, or equivalent? (yes/no) No If no, describe tank removal/closure in place activities? [1] No tanks have been removed or closed in place.
2. Subsurface investigation performed prior to a confirmed release, such as for a property transaction, or to confirm release detection or system failure. (Complete Section F-2 to describe soil boring installations, soil laboratory results, etc.). The release was suspected by an OPS Inspector during his observation of the replacement of overfill protection. Sampling and analysis of soil samples was requested.



## a) List on the table below information concerning site investigation.

| Sample #      | Date of Investigation | Contamination Suspected?<br>(y/n) | Samples Analyzed?<br>(y/n) |
|---------------|-----------------------|-----------------------------------|----------------------------|
| New Motor Oil | July 13, 2007         | N                                 | Y                          |
|               |                       |                                   |                            |
|               |                       |                                   |                            |

b) If this investigation was performed as the result of release detection or system failure what part of the UST system failed? [1] No - The release was suspected by OPS Inspector during replacement of overfill protection. Sampling and analysis of soil samples was requested.

- i. Was the system repaired? (yes/no) The overfill protection assembly will be replaced.
- ii. Date of repair. [1] Repairs have been made. The concrete will be replaced following review approval from the OPS.

## D. SITE CLASSIFICATION AND INITIAL RESPONSE/ABATEMENT

1. Site Classification Table. A site characterization has not been completed. As a result the site classification tables can not be completed.

a) Complete the Site Classification Table presented in Appendix G. See D.1

b) What is the current site classification? (1, 2, 2a, 3, 4) Unknown.

c) Has the site classification changed since the submittal of the Site Summary Form (SSF)? (As the extent of contamination is defined at the time of this report, the Site Classification Table will no longer contain unknown (U) threats). A Site Summary Report was requested by the OPS. The SSR was submitted to the OPS on September 5, 2007

d) What classification was indicated for the site on the SSF? (1, 2, 2a, 3, 4) See D.1

2. Initial response and abatement. (Did the site classification ever indicate the need for an emergency response? (yes/no) No (If yes, answer the following questions and include all supporting documentation such as required permits in Appendix H, and waste manifests in Appendix F.)

a) Was the presence of explosive vapors ever detected at the site? (yes/no) No.

- i. If yes what actions were taken to mitigate explosion risks? [2] See 2.a
- ii. Have these actions been completed? ANA≡

b) Was the presence of vapors or surficial particulates, in concentrations which may cause acute health effects, ever detected at the site? ANA≡

- i. If yes, what actions were taken to mitigate the acute health risks?
- ii. Have these actions been completed? ANA≡

c) **Was the presence of free product on the ground surface, surface water, exposed soils, or in utilities ever detected at the site?** Regarding ground surface and exposed soil – No. No surface water was observed. The need for a utility investigation has not been determined.

i. **If yes, what actions were taken to mitigate these conditions?** [2] ANA≡

ii. **Have these actions been completed?** (yes/no) ANA≡

d) **Was any water supply well, supply line, storm water, or surface water body ever impacted by the release?** (yes/no) The site is connected to city water. Supply lines have not been evaluated. Stormwater was not observed during the site investigation. Given the estimated distance to the Colorado River (800'), it is unlikely that the Colorado River has been impacted.

i. **If yes what actions were taken to mitigate the risk of exposure to these Points of Exposure (POEs)?** [2] ANA≡

ii. **Have these actions been completed?** (yes/no) ANA≡

e) **Are there any other site classification sub-classifications, which relate to potential emergency situations, as listed above (e.g., Sub-classification 2.1 - Explosive vapors may accumulate in buildings within six months) currently applicable to this site?** (yes/no) No.

i. **If yes, are activities underway or completed to mitigate these threats?** [2] ANA≡

ii. **Will mitigation activities be included in the corrective action plan (CAP)?** (yes/no) A CAP for this release has not been requested by the OPS.

## **E. FREE PRODUCT**

1. **Complete this section if free product has been discovered in wells, borings, or excavations.** A site characterization involving wells and borings has not been completed. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

2. **Free Product in Wells or Borings** See E.1

a) **Provide information regarding free product located in wells or borings in Tables 4 and 5, Appendix B.**

b) **On what date was free product discovered?** [1] A site characterization involving wells and borings has not been completed. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

c) **On what date was the OIS notified of the presence of free product?** [1] A site characterization involving wells and borings has not been completed. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

d) **Has free product been recovered?** (yes/no) No

e) **If so, what was the recovery method?** [2] ANA≡

f) What was the quantity recovered? [1] ANA≡

g) How was recovered free product disposed? [1] ANA≡

### 3. Free Product in Excavations

a) Provide information regarding free product discovered in excavations.

| Date Discovered | Location | Product Thickness | Recovery Method | Date Recovery Completed | Quantity Recovered |
|-----------------|----------|-------------------|-----------------|-------------------------|--------------------|
| ANA≡            | ANA≡     | ANA≡              | ANA≡            | ANA≡                    | ANA≡               |
|                 |          |                   |                 |                         |                    |
|                 |          |                   |                 |                         |                    |

Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

b) On what date was the OIS notified of the presence of free product? [1] ANA≡

c) How was recovered free product disposed? [1] ANA≡

## F. SOIL INVESTIGATION

1. Excavations. (Includes excavations, trenches and construction excavations.)

a) Excavation dimensions.

i. Complete the following table for each excavation.

Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

| Excavation #  | Length of Excavation | Width of Excavation | Depth of Excavation | Depth to Groundwater in Excavation (if present) |
|---------------|----------------------|---------------------|---------------------|-------------------------------------------------|
| New Motor Oil | 4 feet               | 4 feet              | 1.5 feet            | Not Present to 1.5                              |
|               |                      |                     |                     |                                                 |
|               |                      |                     |                     |                                                 |

ii. Plot the location of each excavation (include excavation #) on Figure 2, Appendix C.

b) Excavation Organic Vapor Meter (OVM) screening measurements.

i. List all OVM measurements on Table 1, Appendix B.

ii. Indicate the locations of OVM measurements (which did not have a laboratory analysis performed at the same location) on Figure 2a, Appendix C.

**c) Excavation Soil Sampling.**

- i. List all soil laboratory results on Table 2, Appendix B. Identify the locations where samples were obtained on Figure 2, Appendix C.
- ii. List the rationale for the sampling locations on Table 2, Appendix B.
- iii. Present geological observations including lithology in section J.
- iv. Were soils samples collected according to procedures filed with the OIS as part of the Listed Consultant program? Yes According to the OIS Owner/Operator Guidance Document? No If neither, describe soil sampling collection procedures. [3] Only one sample was requested by the OPS for this tank. The sample was collected near the original spill/overfill protection device.

**d) Soil Disposition**

- i. Complete the following table if any soils were excavated.

| Excavation Number | Cubic Yards of Contaminated* Soil Excavated | Disposition of Contaminated *Soil | Cubic Yards of Clean Soil Excavated | Disposition of Clean Soil |
|-------------------|---------------------------------------------|-----------------------------------|-------------------------------------|---------------------------|
| New Motor Oil     | 0                                           | 0                                 | 0                                   | 0                         |
|                   |                                             |                                   |                                     |                           |
|                   |                                             |                                   |                                     |                           |

\* Soil concentrations above Tier 1 RBSLs and 500 mg/kg TPH.

- ii. Attach waste disposal manifests in Appendix F. No soil disposal has occurred.

**e) If groundwater was detected in the excavation complete Section H.**

- f) Was extent defined to Tier 1 RBSLs and to the TPH threshold level of 500 mg/Kg? Yes If no, why not? [2]

**2. Soil Borings/Direct Push Points** Soil sampling involving Borings/Direct Push Points has not been performed at the Site or Requested by the OPS.**a) Borehole/direct push OVM screening.**

- i. Include the OVM screening measurements on the boring logs (Appendix E) for samples screened during the boring installations.
- ii. Indicate the locations of the borings (which did not have laboratory analyses of soil collected from the boring) on Figure 3a, Appendix C.

**b) Soil Sampling in the borehole/direct push points** See 2.0

- i. List all soil laboratory results on Table 2, Appendix B. Present boring locations on Figure 3, Appendix C.
- ii. List the rationale for the sampling locations on Table 2, Appendix B.
- iii. Present geological observations including lithology on the boring logs (Appendix E) and in section J.

iv. Were soils samples collected according to procedures filed with the OIS as part of the Listed Consultant program? ANA≡ According to the OIS Owner/Operator Guidance Document? ANA≡ If neither, describe soil sampling collection procedures. [3]

c) Soil Disposition

i. Were any contaminated soils generated during borehole installation activities? ANA≡ If yes, how were they disposed? [1] ANA≡

ii. If any contaminated soils were disposed, attach waste disposal manifests in Appendix F.

d) Was the extent of soil contamination defined to Tier 1 RBSLs and to the TPH threshold value of 500mg/Kg? Yes If no, why not? [2] A site characterization has not been performed or requested by the OPS.

G. SOIL VAPOR INVESTIGATION

1. Was the purpose of soil vapor sample collection to assist in defining the extent of petroleum hydrocarbon contamination in the subsurface? A soil vapor investigation has not been performed or requested by the OPS.

2. Was the purpose of soil vapor sample collection to identify threats to structures that may be impacted from soil vapors? ANA≡ If yes briefly describe rationale for selected locations and depths (e.g., proximity to source, soil types, utilities, etc.) [3]

3. How many samples were collected from each point? [1] ANA≡

4. Show the location of each sampling point on Figure 4, Appendix C. List sample results, sample location rationale, and depths on Table 3, Appendix B. ANA≡

5. What was the vapor point installation method? [2] ANA≡

6. What was the method of sample collection? [2] ANA≡

7. Were vapor samples collected according to procedures filed with the OIS as part of the Listed Consultant program? ANA≡ According to the OIS Owner/Operator Guidance Document? ANA≡ If neither, describe vapor sampling collection procedures. [3] ANA≡

H. GROUNDWATER INVESTIGATION

1. Were monitoring wells installed, and groundwater sampled? No – A groundwater investigation has not been performed or requested by the OPS.

a) What is the average depth to groundwater at the site? ANA≡

b) For each monitoring well completed at the site list information regarding surveyed elevation of the measuring point, depth to groundwater, depth to product and

groundwater elevation on Table 5, Appendix B. Present the locations of the monitoring wells, including groundwater elevation values on Figure 6, Appendix C.

- c) List all groundwater laboratory results on Table 4, Appendix B. Present monitoring well locations on Figure 5, Appendix C.
2. Was groundwater discovered in locations other than wells (e.g., tank excavations)? A groundwater investigation has not been performed or requested by the OPS
- a) At what locations (other than in wells) was groundwater discovered? [2] ANA≡
- b) Identify the locations where groundwater was discovered (other than in wells) on Figure 5, Appendix C or on Figure 2, Appendix C, as appropriate. If groundwater at these locations was sampled, provide the sample results on Table 4, Appendix B. If groundwater was not sampled at these locations, explain why not [2] ANA≡
- c) If excavation dewatering was necessary, provide volume data, manifests, discharge permits, and compliance sampling results in Appendix H.
3. Were groundwater samples collected according to procedures filed with the OIS as part of the Listed Consultant program? (yes/no) ANA≡ According to the OIS Owner/Operator Guidance Document? (yes/no) ANA≡ If neither, describe groundwater sample collection procedures. [3] A groundwater investigation has not been performed or requested by the OPS.
4. Has the extent of groundwater contamination been defined to concentrations below the MCLs? (yes/no) No If no, why not? [2] A groundwater investigation has not been performed or requested but the OPS.

## I. QUALITY ASSURANCE/QUALITY CONTROL

### 1. Sampling Handling

- a) Was all decontamination performed during this investigation in accordance with the QA/QC filed with the OIS as part of Listed Consultant program? Yes
- b) Was all decontamination performed during this investigation in accordance with the QA/QC as described in Owner/Operator guidance document? Yes



c) If the answer to both of the above is no, complete the following table.

| Equipment | Decontamination Method |
|-----------|------------------------|
| ANA≡      | ANA≡                   |
|           |                        |
|           |                        |

2. Provide all information regarding sample handling and shipping as instructed in Appendix D.

## J. GEOLOGY AND HYDROGEOLOGY

1. Regional Geology -within ½ mile (This information is required if minimal site specific data is available. If the site geology has been characterized, regional data should only be obtained, as necessary, to supplement site specific data).

a) What is the lithology and stratigraphy of the unsaturated and uppermost saturated intervals? [2] Surficial geology consists of unconsolidated alluvial materials. The alluvium includes sands, silts, and gravels.

b) Describe any features that may affect regional groundwater flow. [2] The Site is located approximately 850 feet south of the Colorado River.

c) What is the source of the information listed above? [1] Site observation and knowledge of area.

2. Site Geology (Using the data collected during excavation activities and the drilling logs located in Appendix E answer the following questions. If complex geology exists at the site, which a cross-section would help to illustrate, include it in Appendix E with the borings logs). ANA≡

a) What is the lithology and stratigraphy of the unsaturated and uppermost saturated intervals? [2] Unknown

b) Describe any features at the site which could affect groundwater flow such as the slope of the uppermost bedrock unit [2] Unknown

3. Regional Hydrogeology (within ½ mile) (This information is required if groundwater was not encountered during the site characterization. If groundwater was encountered, regional data should only be obtained, as necessary, to supplement site specific data). Based on the difference in elevation between the Site and Colorado River – The depth to Groundwater is estimated at 300 feet.

a) What is the average depth to groundwater? [1] Unknown

b) What is the average thickness of the uppermost saturated interval? [1] Unknown

c) What is the regional groundwater flow direction? [1] Unknown

- d) Is there evidence that the flow direction may vary? [1] Unknown
- e) What is the source of the information? [1] ANA≡
4. Site Hydrogeology A groundwater investigation has not been performed or requested by the OPS.
- a) What is the average depth to groundwater? [1] Unknown
- b) What is the average thickness of the uppermost saturated interval? [1] Unknown
- c) What is the groundwater flow direction? [1] Based on topography Groundwater Flow Direction is expected to be to the North.
- i. If there is evidence that flow direction varies, include groundwater elevation maps indicating the varying flow directions (Figure 6, Appendix C). Unknown
- ii. What is the suspected or known reason for this variation? [2] ANA≡
- iii. What is the most prevalent flow direction? [1] Based on topography the most prevalent flow direction is to the North.
- d) Complete the following table of aquifer parameters.

| Parameter                 | Value   | How Was This Value Estimated? (Include Identification Numbers of Wells Tested) |
|---------------------------|---------|--------------------------------------------------------------------------------|
| Hydraulic Gradient        | Unknown | Unknown                                                                        |
| Effective Porosity*       | Unknown | Unknown                                                                        |
| Hydraulic Conductivity*   | Unknown | Unknown                                                                        |
| Groundwater Flow Velocity | Unknown | Unknown                                                                        |

\*May be estimated based on soil types during Tier 1 only

## K. POINTS OF EXPOSURE

1. Property Boundary A Site Investigation involving the evaluation of the extent and degree of contamination has not been performed or requested by the OPS.
- a) What is the distance from the source of contamination to the nearest downgradient property boundary? [1] It is estimated at 125 feet.
- b) Provide the location of all site property boundaries on Figure 7, Appendix C.
2. Surficial Soils
- a) Is there reason to suspect that persons will come into contact with surficial soils containing contaminant concentrations not protective of exposure through dermal contact, inhalation, or ingestion? No
- b) If yes, what is the distance from the source to the nearest surficial soils that persons may come into contact with? ANA≡

- c) Indicate the location of all impacted surficial soils that persons may come into contact with on Figure 7, Appendix C.

### 3. Utilities

- a) Are there utilities that could potentially be impacted by the release? (yes/no) Yes
- b) Complete the information concerning all utilities both on-site and off-site on the table below and provide utility locations on Figure 7, Appendix C.

| Utility               | Depth to Water | Depth to Utility | Impacted (y/n) | Potential to be Impacted (y/n) |
|-----------------------|----------------|------------------|----------------|--------------------------------|
| Natural Gas Line      | Unknown        | 4'               | Unknown        | y                              |
| Water Line            | Unknown        | 8'               | Unknown        | y                              |
| Sanitary Sewer Line   | Unknown        | 8'               | Unknown        | y                              |
| Storm Sewer Line      | Unknown        | 8'               | Unknown        | y                              |
| Subsurface Power Line | Unknown        | 4'               | Unknown        | y                              |
| Communication Conduit | Unknown        | 4'               | Unknown        | y                              |
| Other (None)          | -              | -                | Unknown        | y                              |

- c) What is the distance from the source to the nearest impacted or potentially impacted utility? Approximately 30' to the North.
4. Structures (excludes structures that house a business which dispenses petroleum products as part of normal operations). A Site Investigation involving the evaluation of the extent and degree of contamination has not been performed or requested by the OPS.
- a) Are there structures that have been impacted by vapor migration from contaminated groundwater or soils? The occurrence of vapor migration was not noticed during or Site investigation or reported by onsite personnel.
- b) Are there structures that have the potential to be impacted by vapor migration from contaminated groundwater or soils? (yes/no) The occurrence of vapor migration was not noticed during or Site investigation or reported by onsite personnel.
- c) Present all structures, including those that have been impacted or have the potential to be impacted by vapor migration from either contaminated groundwater or soil on Figure 7, Appendix C.
- d) What is the distance from the source to the nearest structure that has been impacted or has the potential to be impacted by vapor migration from contaminated groundwater or soils [1]. 25 feet.

**5. Groundwater Wells (excluding monitoring wells)** A groundwater well search has not been performed or requested by the OPS.

a) List the location and uses of all groundwater wells located within ½ mile of the site. Include this information on Table 6, Appendix B. Present the location of the wells on a U.S.G.S. 7.5' Quadrangle Topographic map (Figure 8, Appendix C).

b) How many groundwater wells are located downgradient and within ½ mile of the site? [1] Unknown

c) Is there a producing groundwater well whose radius of influence could affect groundwater flow at the site? (yes/no) Unknown

d) What is the distance from the source to the nearest downgradient groundwater well? [1] Unknown

**6. Surface Water/Sensitive Environments**

a) Identify the location of all surface water features (lakes, streams, wetlands, etc.) located within ½ mile of the site on Figure 8, Appendix C.

b) What is the distance from the source to the nearest downgradient surface water feature? [1] The Colorado River is located approximately 850 feet North of the Site.

**L. EXPOSURE PATHWAYS**

An evaluation of the extent and degree Characterization has not been performed or requested by the OPS. As a result, The Exposure Pathway Screening Criteria Table cannot be completed.

**a) Complete the Exposure Pathway Screening Criteria Table**

| <b>Exposure Pathway Screening Criteria - Bases for Eliminating Pathways</b>                                                                                                  | <b>Y</b> | <b>N</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|
| <b>Groundwater (Ingestion):</b>                                                                                                                                              |          |          |
| --Impacted groundwater concentrations are below MCLs, or                                                                                                                     |          |          |
| --Impacted water-bearing unit is designated as "non-usable" by the CWQCC, or                                                                                                 |          |          |
| --Groundwater plume is stable or diminishing within the property boundary (as demonstrated by four quarters of monitoring), and                                              |          |          |
| --There is no impact to a water supply well, (active or inactive), and                                                                                                       |          |          |
| --Dissolved oxygen concentrations are higher outside of the defined plume, and                                                                                               |          |          |
| --Groundwater flow velocity is <50 ft/year, and                                                                                                                              |          |          |
| --Transport modeling results are consistent with site observations.                                                                                                          |          |          |
| <b>Groundwater (Enclosed Space Vapors):</b>                                                                                                                                  |          |          |
| --Impacted groundwater concentrations are below MCLs, or                                                                                                                     |          |          |
| --No existing structure is within the influence of the contamination, or                                                                                                     |          |          |
| --There is an existing structure within the influence of the contamination, and the structure houses a business which dispenses petroleum products as part of its operation. |          |          |
| <b>Surficial Soils (Ingestion, Ambient Vapors, Particulates, Dermal Contact):</b>                                                                                            |          |          |
| --Impacted soils concentrations below Tier 1 limits, or                                                                                                                      |          |          |
| --Impacted soils have been removed from the site.                                                                                                                            |          |          |
| <b>Subsurface Soils (Enclosed Space Vapors):</b>                                                                                                                             |          |          |
| --Impacted soils are below Tier 1 limits, or                                                                                                                                 |          |          |
| --No existing structure is within the influence of the contamination.                                                                                                        |          |          |
| --There is an existing structure within the influence of the contamination, and the structure houses a business which dispenses petroleum products as part of its operation. |          |          |
| <b>Subsurface Soils (Leaching to Groundwater):</b>                                                                                                                           |          |          |
| --Impacted soils are below Tier 1 limits.                                                                                                                                    |          |          |

- b) Do the responses to the Exposure Pathway Screening Criteria Table indicate that any pathways may be eliminated from further consideration? (yes/no) Unknown**
- c) Are there any conditions not included in the table that may result in the elimination of any additional pathways? (yes/no) Unknown**
- d) If so, identify the pathway and conditions here. Any pathway elimination not specified in the table is subject to OIS approval. [4] ANA≡**
- e) For all pathways that may be eliminated, attach any supporting documentation (e.g., documentation of a "non-useable" designation by the CWQCC) in Appendix H.**

**f) What are the completed exposure pathways? See L.**

- i. Groundwater (Ingestion) (yes/no)**
- ii. Groundwater (Enclosed Space Vapors) (yes/no)**
- iii. Surficial Soils (Ingestion, Ambient Vapors, Particulates, Dermal Contact) (yes/no)**
- iv. Subsurface Soils (Enclosed Space Vapors) (yes/no)**
- v. Subsurface Soils (Leaching to Groundwater) (yes/no)**

**M. LAND USE**

- 1. All sites are considered under the residential land use classification unless the industrial classification is requested and approved by the OIS. Is an industrial classification being requested for this site? (yes/no) An Industrial land use may be appropriate.**
  - a) If yes, is the property and any currently or potentially impacted property currently zoned Industrial? (yes/no) The Site and surrounding property is zoned light industrial.**
  - b) If yes, has the OIS been added to the list of parties to be notified of any application for rezoning? (yes/no) No**
  - c) If yes, include official documentation of the addition of the OIS to this list (this documentation must indicate that the OIS will remain on the list until the OIS requests to be removed from the list). Include this documentation in Appendix H.**



**N. RISK BASED SCREENING LEVEL (RBSL) SELECTION**

A Site Characterization involving the evaluation of the extent and degree of soil contamination has not been performed or requested by the OPS.

1. Complete the following table to determine the appropriate RBSL(s) for the site. Refer to the OIS Storage Tank Regulations (7 C.C.R. 1101-14, Table 5-1) for the Tier 1 RBSL look-up table. If a "y" has been indicated in the Pathway Completed column, the RBSL and Source Concentration columns should be completed for every COC that exceeds the Tier 1 RBSL in Table 5-1. Consider the Land Use designation for the site to determine the correct RBSL for each completed pathway.

| Exposure Pathway                              | Pathway Completed (y/n) | Chemical of Concern (COC) | RBSL | Source Concentration |
|-----------------------------------------------|-------------------------|---------------------------|------|----------------------|
| Surficial Soil (mg/Kg)                        |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |
| Soil Leaching to groundwater (mg/Kg)          |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |
| Soil Vapor to Indoor Air (ug/m <sup>3</sup> ) |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |
| Groundwater to Indoor air inhalation (mg/l)   |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |
| Groundwater Ingestion (mg/l)                  |                         | Benzene                   |      |                      |
|                                               |                         | Toluene                   |      |                      |
|                                               |                         | Ethylbenzene              |      |                      |
|                                               |                         | Xylene                    |      |                      |

**2. RBSLs per media**

- a) Were both the Surficial Soil and Soil Leaching to Groundwater exposure pathways complete? (yes/no) If yes, the RBSLs for soil will be those for the Soil Leaching to Groundwater exposure pathway. Unknown
- b) Were both the Groundwater to Indoor Air Inhalation and Groundwater Ingestion pathways complete? (yes/no) If yes, the RBSLs for groundwater will be those for the Groundwater Ingestion exposure pathway. Unknown

**O. TOTAL PETROLEUM HYDROCARBONS (TPH)/POLYNUCLEAR AROMATIC HYDROCARBONS (PAH)**

A Site investigation involving the evaluation of the extent and degree of soil contamination has not been performed or requested by the OPS.

**1. Source concentrations**

a) Are all of the concentrations of the chemicals of concern (benzene, toluene, ethylbenzene, xylenes) associated with this release below the RBSLs or SS-RBSLs? (yes/no) Based upon the one soil sample collected at the Site, RBSLs for BTEX have not been exceeded.

b) Does the TPH concentration exceed the threshold value of 500 mg/Kg? No, the oil and grease concentration is 310 mg/Kg..

**2. PAH Evaluation - If both answers to question #1 above are yes, then a soil sample collected from the area believed to be the most contaminated must be analyzed for the 16 priority PAHs. For the following questions refer to the Tier 1 RBSL table for PAHs in the Owner/Operator Guidance Document.**

a) If the surficial soil pathway is complete at this site answer the following questions:

i. Do site PAH concentrations exceed the Tier 1 RBSLs for any compounds for the surficial soil pathway? PAH analysis was not requested by the OPS.

ii. If yes, list the compounds that exceed the RBSLs and the concentrations at which they remain on the site. ANA≡

b) If the subsurface soil leaching to groundwater pathway is complete at this site answer the following questions:

i. Do site PAH concentrations exceed the Tier 1 RBSLs for benz(a)-anthracene, dibenz(a,H)-anthracene or naphthalene compounds for the subsurface soil leaching to groundwater pathway? PAH analysis was not requested by the OPS.

ii. If yes, list the compounds at the site that exceed the RBSLs for the above compounds and the concentrations at which they remain on the site.

iii. Do PAH levels exceed the Tier 1 RBSLs for the 13 chemicals not specified in "i" above for the surficial soil pathway? (yes/no) PAH analysis was not requested by the OPS.

iv. If yes, list the compounds at the site that exceed the RBSLs for the above compounds and the concentrations at which they remain on the site. See O.2.b.iii.

c) If the groundwater volatilizing to indoor air pathway is complete at this site answer the following questions: A groundwater investigation has not been performed or requested by the OPS.

- i. Do site naphthalene concentrations exceed the Tier 1 RBSL for the groundwater volatilizing to indoor air pathway? (yes/no) Unknown
- ii. If yes, what is the concentration of naphthalene in groundwater remaining on the site? ANA≡

d) If the groundwater ingestion pathway is complete at this site answer the following questions: See O.2.c

- i. Do site benzo(a)-pyrene concentrations exceed the Tier 1 RBSL for the groundwater ingestion pathway? (yes/no) Unknown
- ii. If yes, what is the concentration of benzo(a)-pyrene in groundwater remaining on the site? Unknown

**P. TIER 1A**

1. Has a Tier 1A evaluation been performed for this site? (yes/no) No
2. Was there reason to believe, based on site conditions, that the collection of site-specific information would lead to a significantly different cleanup goal? (yes/no) Unknown
3. Were site-specific data collected to be used as input parameters into the Tier 1A Model? (For a Tier 1A evaluation, site-specific data must be collected from the site, or calculated from data collected from the site, as outlined in the Owner/Operator Guidance Document.) (yes/no) No

4. If site-specific input parameters were used to create Tier 1A SS-RBSLs, list those parameters on the following table and indicate the source of the data. Include locations where data are collected on the appropriate figure. A site characterization has not been performed or requested by the OPS.

| Parameter                         | Value | How Was This Value Determined? (Include Identification Numbers of Wells Tested, Location of Borings, etc.) |
|-----------------------------------|-------|------------------------------------------------------------------------------------------------------------|
| Depth to subsurface soil source   |       | Unknown                                                                                                    |
| Depth to groundwater              |       | Unknown                                                                                                    |
| Thickness of the capillary fringe |       | Unknown                                                                                                    |
| Thickness of the unsaturated zone |       | Unknown                                                                                                    |
| Length of source                  |       | Unknown                                                                                                    |
| Width of source                   |       | Unknown                                                                                                    |
| Hydraulic conductivity            |       | Unknown                                                                                                    |
| Gradient                          |       | Unknown                                                                                                    |
| Fraction of organic carbon        |       | Unknown                                                                                                    |
| Total porosity                    |       | Unknown                                                                                                    |
| Unsaturated zone water content    |       | Unknown                                                                                                    |
| Unsaturated zone air content      |       | Unknown                                                                                                    |
| Infiltration rate                 |       | Unknown                                                                                                    |
| Soil bulk density                 |       | Unknown                                                                                                    |
| Distance to point of exposure     |       | Unknown                                                                                                    |
| Effective porosity                |       | Unknown                                                                                                    |

5. Attach the Tier 1A SS-RBSL table generated by inputting site specific data collected above into the Tier 1A Model (located on the OIS webpage)

#### Q. RECOMMENDATIONS

1. Are all source concentrations remaining at the site below RBSLs in soil and MCLs in groundwater? (yes/no) Unknown If yes, you may request no further action. A groundwater investigation has not been performed or requested by the OPS.
2. Are source concentrations remaining at the site above RBSLs in soil and/or MCLs in groundwater? (yes/no) An investigation involving evaluation of the extent a degree of soil contamination or groundwater evaluation has not been performed or requested by the OPS. If yes, do you recommend remediation to Tier 1 levels? (yes/no) Unknown What method(s) of remediation will you be evaluating in your corrective action plan (CAP)? [2] Unknown
3. Have you performed a Tier 1A evaluation? (yes/no) No Are all source concentrations remaining at the site below the SS-RBSLs generated in the Tier 1A evaluation? (yes/no) Unknown  
If yes, you may request a no further action.

4. Have you performed a Tier 1A evaluation? (yes/no) No Are source concentrations remaining at the site above the SS-RBSLs generated in the Tier 1A evaluation? (yes/no) Unknown If yes, do you recommend remediation to Tier 1A levels, or Tier 1 levels? (yes/no) Unknown What method(s) of remediation will you be evaluating in your CAP?[2] Unknown

5. Have you performed a Tier 1A evaluation? (yes/no) No Are source concentrations remaining at the site above the SS-RBSLs generated in the Tier 1A evaluation? (yes/no) Unknown If yes, do you recommend proceeding to a Tier 2 evaluation? (yes/no) Unknown What method(s) of remediation will you be evaluating in your CAP to cleanup to Tier 2 should site specific target levels be exceeded? [2] Unknown

**APPENDIX A - INSTRUCTIONS****1. TABLES (Appendix B)****Table 1 - Summary of Organic Vapor Meter Readings**

This table lists the results of field screening of soil samples with an Organic Vapor Meter (OVM). Information presented shall include sample location, OVM reading, sample depth (ft bgs), and an indication of whether the sample was analyzed at a laboratory.

**Table 2 - Summary of Soil Laboratory Results**

This table lists the results obtained from laboratory testing of soil samples. Information presented shall include sample designation, sample collection date, sample depth (ft bgs), and analyte concentrations. If any analyte was detected which is not listed on this table, answer Ayes in the AOther column and attach the laboratory analytical reports for those analytes. Concentrations that exceed the Tier 1 RBSL for the soil leaching to groundwater pathway must be entered in bold type face. Also include on Table 2 the rationale for sample collection, using the codes listed in the footnote.

**TVPH = Total Volatile Petroleum Hydrocarbons**

**TEPH = Total Extractable Petroleum Hydrocarbons**

**TPH = Total Petroleum Hydrocarbons**

**Table 2a - Summary of PAH Soil Laboratory Results**

If a sample was analyzed for the priority PAHs the results obtained from the laboratory testing should be listed on this table. Information presented shall include sample designation, sample collection date, sample depth (ft bgs), and analyte concentrations in mg/Kg. This analysis will only be required when the BTEX constituents are below site cleanup goals and TPH concentrations exceed 500mg/Kg.



**Table 3 - Summary of Vapor Laboratory Results**

This table lists the results obtained from laboratory testing of vapor samples. Information presented shall include sample designation, sample collection date, sample depth (ft bgs), and analyte concentrations. If any analyte was detected which is not listed on this table, answer Ayes= in the AOther= column and attach the laboratory analytical reports for those analytes. Also included on this table is the rationale for sample collection.

**Table 4 - Summary of Groundwater Laboratory Results**

This table must be included when water samples are collected and shall present the results obtained from laboratory testing of water samples. Information presented shall include sample designation, sample collection date, sample depth (depth below grade level when collected from an excavation), analyte concentrations, and analytical methods. If any analyte was detected which is not listed on this table, answer Ayes= in the AOther= column and attach the laboratory analytical reports for those analytes. Concentrations that exceed Colorado groundwater standards (MCLs) shall be presented in boldface type. Sample locations must be illustrated on Figure 5.

**Table 5 - Groundwater Elevation Table**

This table shall include the surveyed elevation of each well measured during this investigation, the date of the measurement, depth to water, depth to product, product thickness, product elevation, and the corrected elevation of the groundwater.

**Table 6 - Summary of Water Well Information**

This table shall include the results of a water well survey for wells located within 2 mile of the site. Information presented shall include the well number, geographic location (cadastral coordinates), approximate distance from site (if known), approximate compass direction from site (if known), use of each well, well depth, water level, and pumping rate. Wells down gradient of the site shall be presented in boldface type.

**2. FIGURES (Appendix C)**

Requirements common to all maps include the following: title block with figure number, site name, site address, date, scale, north arrow, and a legend. Distinct symbols should be used to differentiate varying sampling and analytical techniques (e.g. = Monitoring Well, = Borehole, = Geoprobe Point, = OVM locations,  $\Phi$  = laboratory data). All maps must be created to scale.

**Figure 1 - Site Map**

This map shall illustrate the important features at the site and the area immediately adjacent to the site. Include locations of property boundaries, fences, streets (with names), site buildings and adjacent structures, USTs/ASTs, piping runs and dispensers, and type of ground cover.

**Figure 2 - Excavation Sample Location Map**

This map shall illustrate the former locations of the tanks, and the sampling locations from within each tank excavation. For each of these sampling locations include a text box with sample depth and laboratory analytical results. Also include on the map the location of soils stockpiled. Clearly identify the dimensions of the excavation areas. Include features from Figure 1 as necessary for reference (e.g., major structures).

Diesel ex 4x5

Gas ex 5x9

**Figure 2a - OVM Screening Locations**

The one soil sample obtained at the Site was not screened using an OVM.

This map shall illustrate locations of samples collected for soil screening (as indicated in Table 2), which were not submitted to the laboratory for analysis. Include features from Figure 1 as necessary for reference (e.g., major structures, excavations, etc.). If the screened soils were submitted for analysis the location of the sample should not be identified on this figure, but should be placed on either Figure 2 or 3.

**Figure 3 - Soil Sample Location Map**

This map shall illustrate the sampling locations at the site (outside of the tank excavation(s)). Include features from Figure 1 as necessary for reference (e.g., major structures, excavations, etc.) For each of these sampling locations include a text box with sample depth and laboratory analytical results.

**Figure 4 - Vapor Sample Location Map**

A site investigation involving vapor sampling has not been performed or requested by the OPS.

This map shall illustrate the sampling locations at the site. Include features from Figure 1 as necessary for reference (e.g. major structures, excavations, etc.). For each of these sampling locations include a text box with sample depth and laboratory analytical results.

**Figure 5 - Groundwater Sample Location Map**

A site investigation involving a groundwater evaluation has not been performed or requested by the OPS.

This map shall illustrate the groundwater sampling locations at the site. Include features from Figure 1 as necessary for reference (e.g., major structures, excavations, etc.). For each of these sampling locations include a text box with laboratory analytical results.

**Figure 6 - Groundwater Elevation Map**

A site investigation involving a groundwater evaluation has not been performed or requested by the OPS.

This map shall illustrate the locations at which groundwater levels have been measured. Figure 1 may be used as a base map. Include the date of the measurement (separate maps must be created for individual measuring events) and the relative groundwater elevation.

**Provide groundwater elevation contours and an indication of the groundwater flow direction.**

#### **Figure 7 – POE Location Map**

A site investigation involving an evaluation of potential receptors has not been performed or requested by the OPS.

This figure will identify each property in the vicinity of the site which could potentially be affected by the release. The properties will be illustrated by land use (e.g., single family residential, vacant land, retail, dry cleaning, gas station, etc.). This figure will also identify all potential POEs (property boundaries, surficial soils, subsurface utilities, groundwater wells and surface water features/sensitive environments).

#### **Figure 8 – Area Surface Water, Groundwater, Topographical Map**

This map is used to provide regional topographic and POE information. Include a portion of a U.S.G.S. 7 2' Quadrangle Topographic Map or equivalent, measuring a minimum of six inches by six inches with the site located in the middle of the six inch by six inch section. The map shall include a scale (approximately 1" = 2,000'), distinct site location marker, and geographic contour intervals. Clearly identify surface water features and water wells (excluding monitoring wells) within ½-mile radius of the site. Provide a text box with the associated permit number (as indicated in Table 6) of each water well location.

Note: A groundwater well inventory has not been performed or requested by the OPS.

### **3. LABORATORY DOCUMENTATION (Appendix D)**

Chain of Custody forms which accompany samples for laboratory analyses are required to contain the following information: site name and address, sample number, date and time sampled, matrix description (e.g. soil, water), container size, type and decontamination status (e.g. 40 ml laboratory decontaminated amber glass VOA vial), preservation method (e.g. HCl 5%, 4E C), date and method of transport to laboratory (e.g. hand delivered, Fed Ex etc.), analyte and methodology of analyses requested (e.g. Total Extractable Petroleum Hydrocarbons (TEPH) by EPA Method 8015 Modified), and the name and signature of the person collecting the samples. Also attach all laboratory reports, and laboratory quality assurance/quality control reports.

### **4. BOREHOLE LITHOLOGIC LOGS AND WELL COMPLETION (Appendix E)**

A site investigation involving borehole has not been performed or requested by the OPS.

Boring logs must include the site name and address, boring number, date completed, surface elevation, depth, borehole diameter, initial and static water levels (if available), drilling method, sampling method, lithologic graphic to scale, an indication of the intervals from which samples were obtained, results of VOC screening, and a geologic description and/or Unified Soil Classification System (USCS) class of each rock or soil type encountered including any staining or petroleum odors.

The following additional information should be included with the lithologic logs if a well has been completed. Include the total depth of the well, the casing elevation, the diameter of the well casing, the well casing material (e.g. PVC, stainless steel), the length and depth

of the screened interval, the size and type of perforations of the screen (e.g. 0.010" milled slots), the type of filter pack material placed in the well (e.g. 10-20 mesh washed silica sand), the type of annular seal (e.g. 1/2" bentonite pellets), the type of grout used to fill the remaining annular space (e.g. Portland cement 5% bentonite), the type of well casing cap, the method of securing the well casing cap, and the type of protective surface casing. Also included should be a well completion graphic to scale which indicates the depth to the top of the filter pack, the depth to the top of the annular seal, and the location of the screened interval.

Also included in Appendix E should be any cross-sections completed to illustrate site conditions.

#### **5. WASTE DISPOSAL MANIFESTS (Appendix F)**

Contaminated soil removal has not been performed or requested by the OPS.

Attach copies of all manifests provided by transporters, landfills, treatment facilities, etc.

#### **6. SITE CLASSIFICATION CHECKLIST (Appendix G)**

To complete the Site Classification Checklist, place a check in the Threat (T) box if the situation, designated by sub-class (SUB), exists at the site. If the threat does not exist, check the N box. The U box should only have been checked when the Site Classification Checklist was submitted with the Site Summary Form. Upon completion of this report all conditions which exist at the site should be known. Check the Response (R) box if an appropriate response action has been completed for the existing condition at the site. If the response action has been completed and the threat no longer exists, the site classification will be the classification of the next most highly listed threat. The site will be classified by the first table where a threat box has been checked and an appropriate response has not been completed. However, complete the entire form and perform appropriate response actions for each condition which exists at the site. Complete response actions in order of highest priority (1 being the highest).

#### **7. SUPPORTING DOCUMENTATION (Appendix H)**

Attach all supporting documentation as required (e.g., permits for initial response and abatement activities, industrial zoning designation, water quality designation, etc.).

**APPENDIX B - TABLES**

**TABLE 1- SUMMARY OF ORGANIC VAPOR METER READINGS**

OVM measurements were not taken during our site investigation, as an OVM meter was not readily available.

| Sample Location I.D. | Date | Sample Depth (ft) | OVM Reading (ppm) | Laboratory Analyzed (y/n) |
|----------------------|------|-------------------|-------------------|---------------------------|
| N/A                  | N/A  | N/A               | N/A               | N/A                       |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
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|                      |      |                   |                   |                           |
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|                      |      |                   |                   |                           |
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|                      |      |                   |                   |                           |
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|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |
|                      |      |                   |                   |                           |

N/D = Not Detected

N/A = Not Analyzed



Packet Page 1528

[illegible]

Identify any sample results which exceed Tier 1 RBSLs for soil leaching to groundwater pathway or 500mg/Kg TPH by presenting those results in bold typeface.  
 N/D = Less than the stated laboratory detection limit  
 N/A = Not Analyzed

Dezember 1991 - 1992

If yes, list other analytes detected in a separate table

\*\*\*\*Rationale – Release confirmation (RC), In plume (IP), Upgradient (UG), Downgradient (DG), Point of Compliance (POC), Post excavation (PE), Define extent (DE), W. characterization (WC)



### TABLE 3 - SUMMARY OF VAPOR LABORATORY RESULTS

| A site characterization involving an evaluation of vapors has not been performed or requested by the OPS. |   |
|-----------------------------------------------------------------------------------------------------------|---|
| 1                                                                                                         | 2 |

[illegible]

N/D = Less than the stated laboratory detection limit

N/A = Not Analyzed

\* If "yes", list other analytes detected in a separate table

Rationale – Assist in defining extent (DE), Identify threats to points of exposure (POE)

**TABLE 4 - SUMMARY OF GROUNDWATER LABORATORY RESULTS**

A site characterization involving wells and borings has not been completed or observed by the OPS. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS

[illegible]

Identify any sample results which exceed Colorado Groundwater Standards (MCLs) by presenting those results in bold typeface.  
N/D = Less than the stated laboratory detection limit

\* If [ yes ], list other analytes detected in a separate table

\*\*Rationale – Release confirmation (RC), In plume (IP), Up

Waste characterization (WC)

**TABLE 5 - GROUNDWATER ELEVATION**

A site characterization involving wells and borings has not been completed or requested by the OPS. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS

[illegible]

A site characterization involving wells and borings has not been completed or requested by the OPS. Free product was not observed to a maximum depth excavated at the site of 1.5 feet BGS.

[illegible]

\*Information from the Colorado Division of Water Resources

Indicate any wells which appear to be downgradient of the site in bold typeface.

Uses: Q = Other I Use OM = Other Uses/M

Uses: 0 = Other Use, OM = Other Use (Monitoring Well), 1 = Agricultural, 3 = Commercial Use, 8 = Domestic Use, 9 = Livestock Use

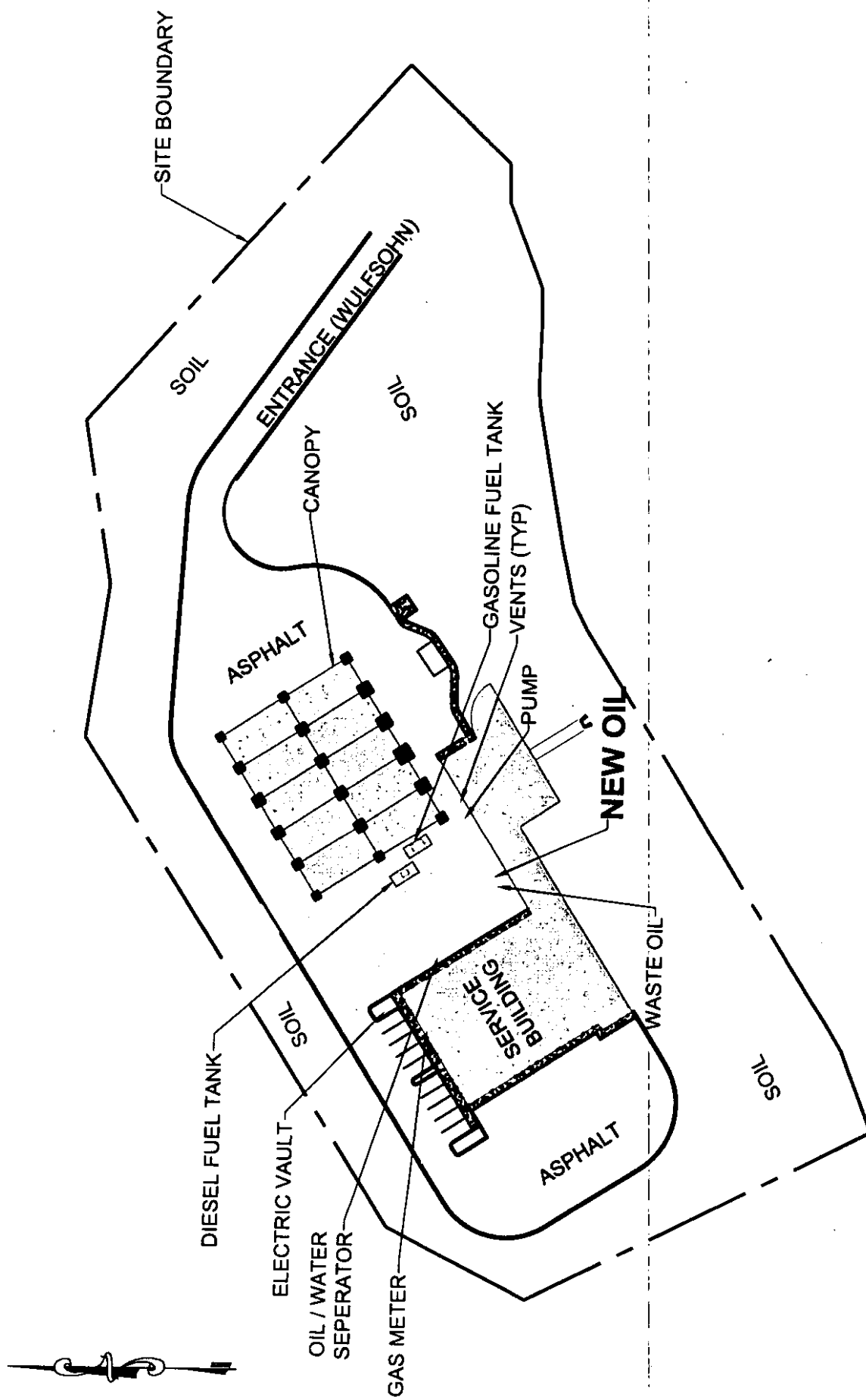
Site Street Address \_2307 Wulfsohn Road

City Glenwood Springs

## APPENDIX C - FIGURES



C:\Projects\ME\002-54\0205\A\3312 W25B.dwg



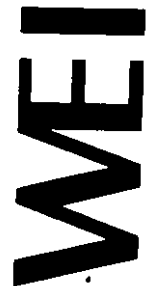
ROARING FORK TRANSIT AUTHORITY  
FIGURE 1  
SITE MAP

|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

**WEI**

THE SOIL SAMPLE WAS NOT  
SCREENED USING AN OVM



WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BILL      |
| DETAIL | BILL      |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY  
FIGURE 2a  
OVM SCREENING LOCATIONS

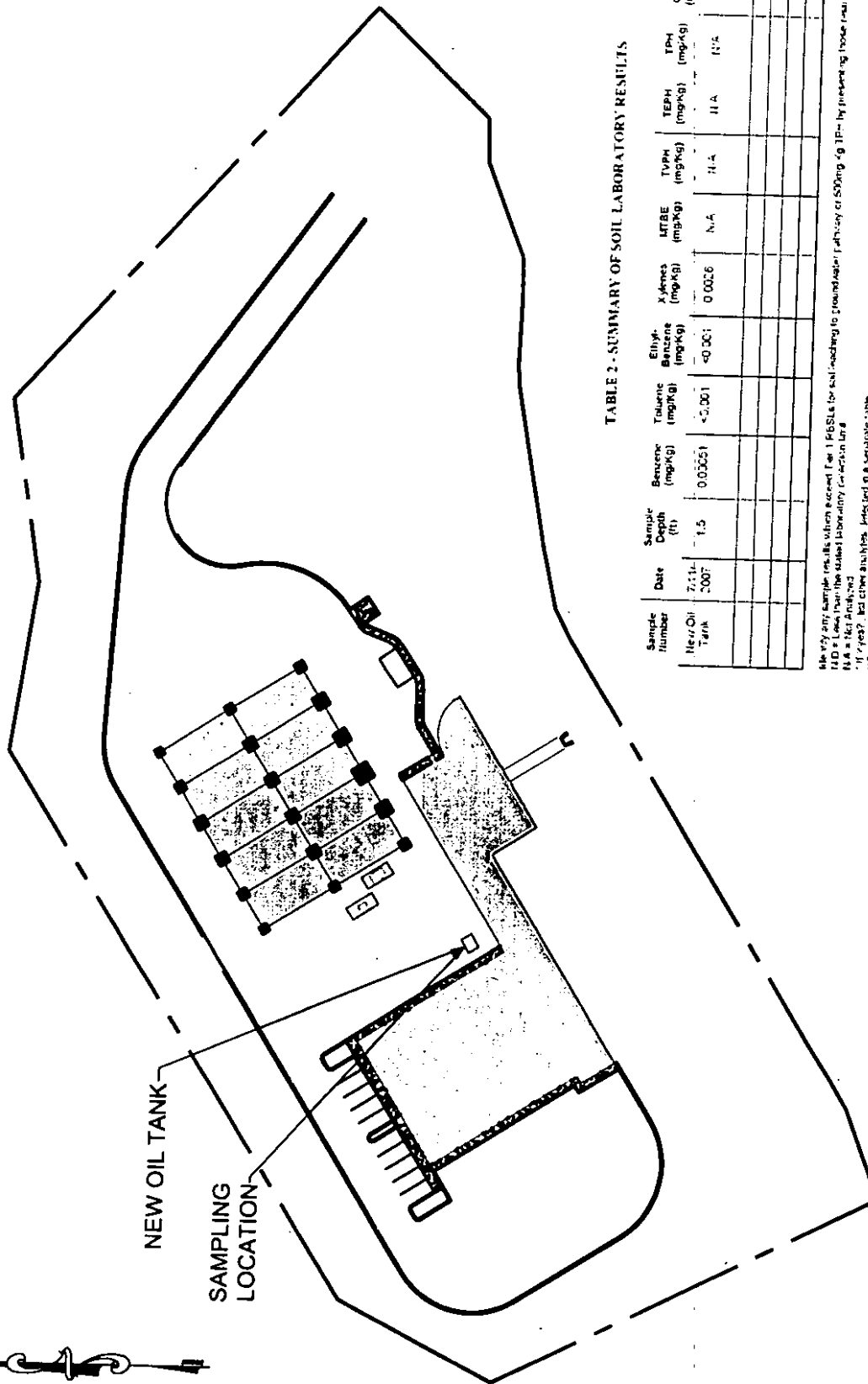


TABLE 2 - SUMMARY OF SOIL LABORATORY RESULTS

[illegible][illegible]

characterization (hC)

**WASTE  
ENGINEERING, INC.**  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

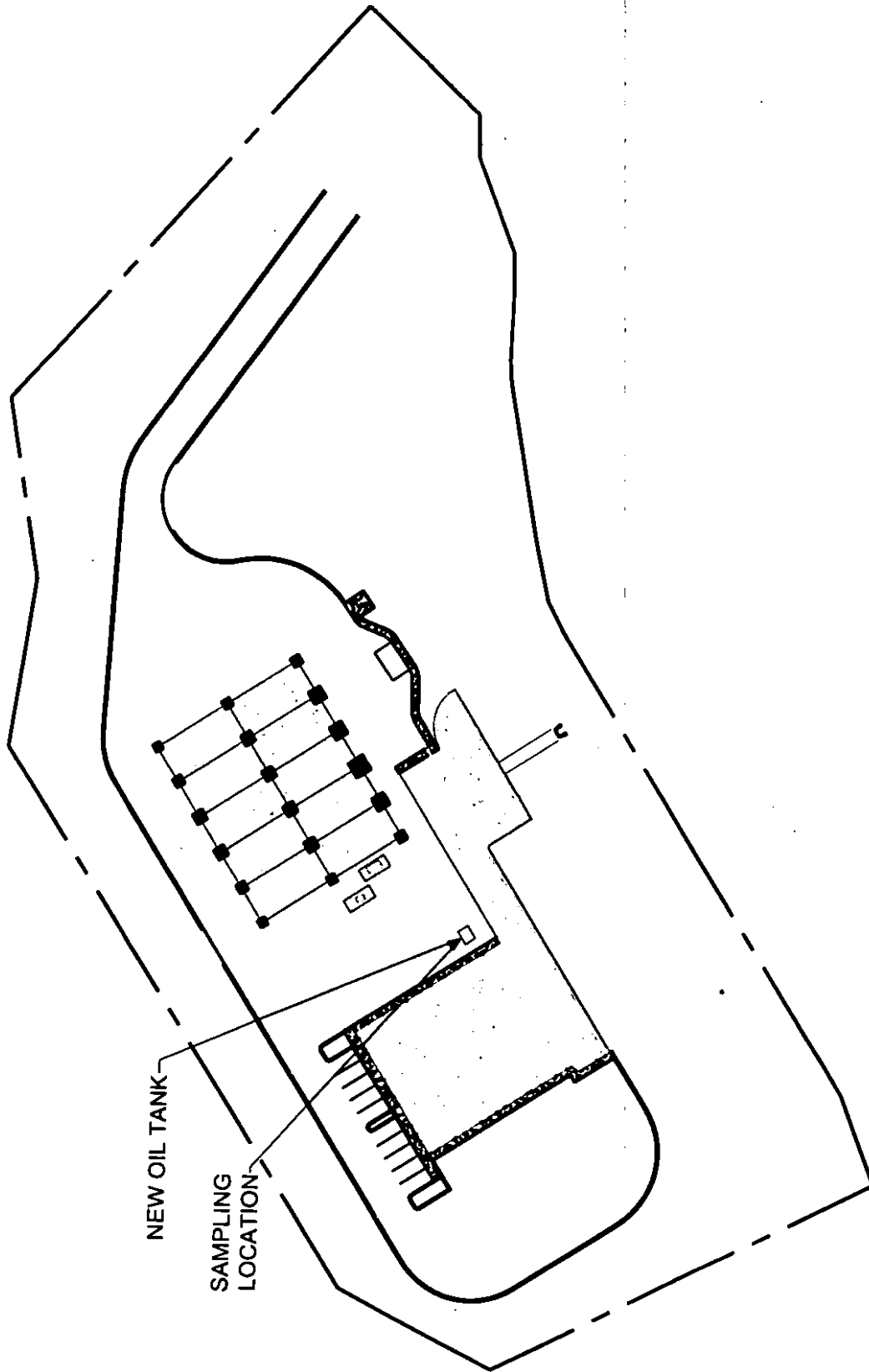
|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY

FIGURE 2

EXCAVATION SAMPLE LOCATION MAP

# WE



ROARING FORK TRANSIT AUTHORITY  
FIGURE 3  
SOIL SAMPLE LOCATION MAP

|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

**WEI**

A SITE INVESTIGATION INVOLVING  
VAPOR SAMPLING HAS NOT BEEN  
PERFORMED OR REQUESTED BY  
THE OPS



WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY  
FIGURE 4  
VAPOR SAMPLING LOCATION MAP

A SITE INVESTIGATION INVOLVING  
A GROUNDWATER EVALUATION  
HAS NOT BEEN PERFORMED OR  
REQUESTED BY THE OPS

**WEI**

WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BILL      |
| DETAIL | BILL      |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY

FIGURE 5

GROUNDWATER SAMPLING LOCATION MAP

A SITE INVESTIGATION INVOLVING  
A GROUNDWATER EVALUATION  
HAS NOT BEEN PERFORMED OR  
REQUESTED BY THE OPS

**WEI**

WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BILL      |
| DETAIL | BILL      |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY

FIGURE 6

GROUNDWATER ELVATION MAP



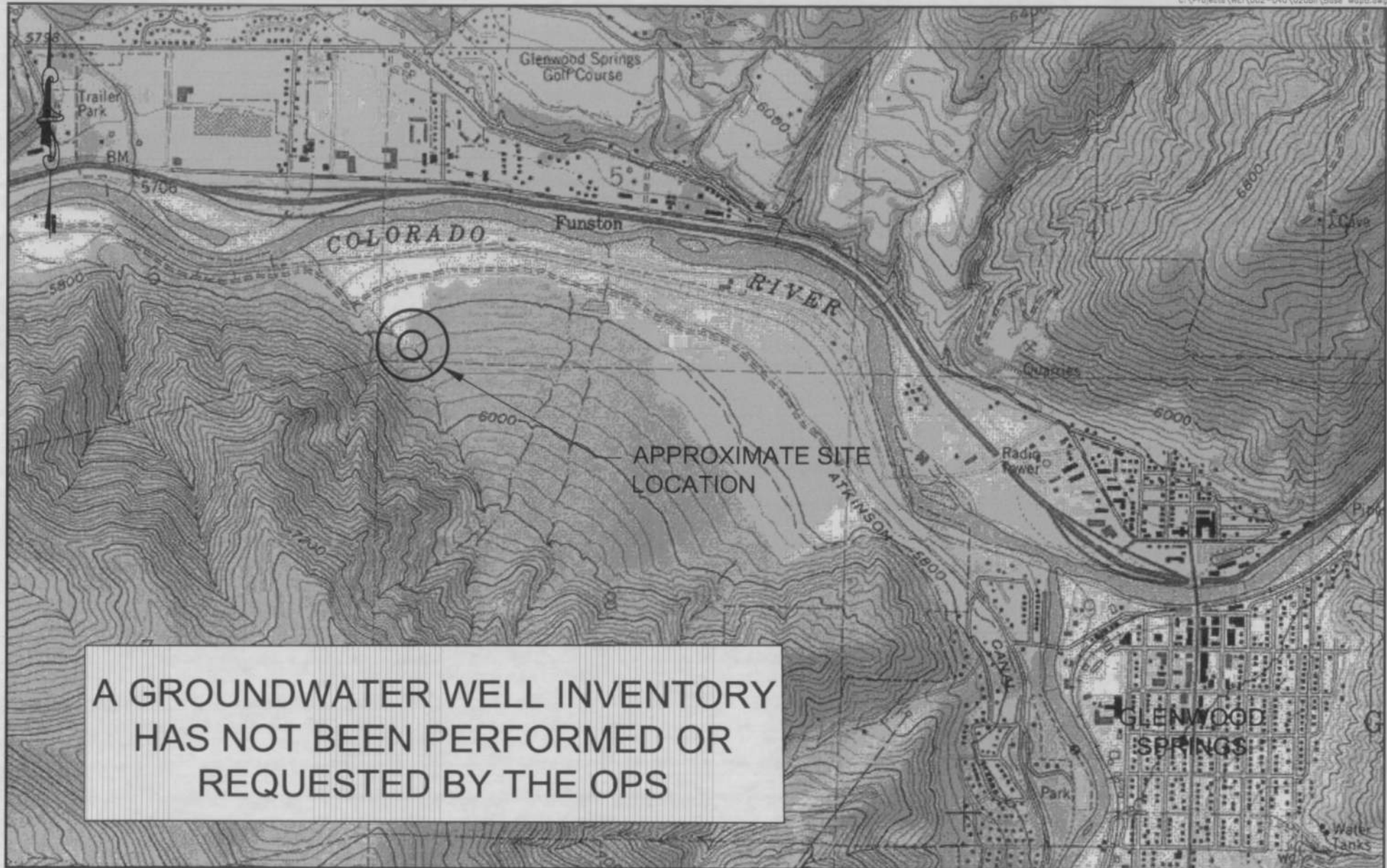
A SITE INVESTIGATION INVOLVING AN  
EVALUATION OF POTENTIAL RECEPTORS  
HAS NOT BEEN PERFORMED OR  
REQUESTED BY THE OPS



WASTE  
ENGINEERING, INC.  
818 COLORADO AVENUE  
GLENWOOD SPRINGS, CO 81601  
(970) 945-7755

|        |           |
|--------|-----------|
| DESIGN | BLL       |
| DETAIL | BLL       |
| CHECK  | DCH       |
| DATE   | 10/17/07  |
| SCALE  | 1" = 100' |

ROARING FORK TRANSIT AUTHORITY  
FIGURE 7  
POE LOCATION MAP



## APPENDIX D - LABORATORY DOCUMENTATION



Analytica Environmental  
Laboratories, Inc.  
12189 Pennsylvania Street  
Thornton, CO 80241  
Phone: 303-469-8868  
Fax: 303-469-5254

7/31/2007

Waste Engineering, Inc.  
P.O. Box 219  
Glenwood Springs, CO 81602  
Attn: Craig Heydenberk

Work Order #: B0707088  
Date: 7/31/2007  
Work ID: RFTA  
Date Received: 7/12/2007  
Proj #: none

#### Sample Identification

| Lab Sample Number | Client Description | Lab Sample Number | Client Description |
|-------------------|--------------------|-------------------|--------------------|
| B0707088-01       | W 0 @ 1.5'         |                   |                    |

Enclosed are the analytical results for the submitted sample(s). Please review the CASE NARRATIVE for a discussion of any data and/or quality control issues. Listings of data qualifiers, analytical codes, key dates, and QC relationships are provided at the end of the report.

Sincerely,

Joseph Egry  
Project Manager

*"The Science of Analysis, The Art of Service"*

## Case Narrative

Analytica Environmental Laboratories, Inc.

Work Order: B0707088

Samples were prepared and analyzed according to EPA or equivalent methods outlined in the following references:

USEPA Method 1664, EPA-821-B-94-004b, N-Hexane Extractable Material (HEM) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM) by Extraction and Gravimetry (Oil and Grease and Total Petroleum Hydrocarbons), April 1995.

Test Methods for Evaluating Solid Waste, USEPA SW-846, Third Edition, Revision 4, December 1996.

Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures, ASTM D 2216-80, July 1980.

### REVIEW FOR COMPLIANCE WITH ANALYTICA QA PLAN

A summary of our review is shown below, organized by test:

#### SAMPLE RECEIPT:

One sample was received at a temperature of 3.3 deg C at Analytica-Thornton on 7/12/2007 9:50:00 AM. Custody seals were not present on the shipping container when received by the laboratory.

Test Method: 1664 FOR SOILS - Total - Solid

#### HOLDING TIMES:

Holding times were met for this Test

#### SAMPLE PREPARATION ISSUES AND OBSERVATIONS:

There were no unusual observations.

#### METHOD BLANK OUTLIERS:

There are no method blank outliers.

#### LCS OUTLIERS:

There are no LCS outliers.

#### MS/MSD and DUP OUTLIERS:

There are no MS/MSD or DUP outliers.

Test Method: Aromatic VOCs by GC/PID via method 8021B - BTEX - Solid

#### HOLDING TIMES:

Holding times were met for this Test

#### SAMPLE PREPARATION ISSUES AND OBSERVATIONS:

There were no unusual observations.

#### INSTRUMENT PERFORMANCE CHECKS:

Instrument checks were within method criteria.

#### INITIAL CALIBRATIONS:

Initial calibrations were within method criteria.

#### OPENING CONTINUING CALIBRATIONS:

## Case Narrative

Analytica Environmental Laboratories, Inc.

Work Order: B0707088

(continued)

The opening and closing CCVs are in control for the targets.

| RunDate              | Data File  | Analyte              | Recovery | LCL | UCL |
|----------------------|------------|----------------------|----------|-----|-----|
| 7/25/2007 6:23:00 PM | 07072502.D | p-Bromofluorobenzene | 72.1     | 85  | 115 |

### CLOSING CONTINUING CALIBRATIONS:

| RunDate               | Data File  | Analyte              | Recovery | LCL | UCL |
|-----------------------|------------|----------------------|----------|-----|-----|
| 7/26/2007 12:33:00 AM | 07072512.D | p-Bromofluorobenzene | 68.0     | 85  | 115 |

### SURROGATE RECOVERIES:

The LCS and LCSD have the surrogate outside of control windows. All associated samples have normal surrogate recoveries and the LCS and LCSD have normal target recoveries.

| Sample | LabID           | Surrogate            | Recovery | LCL | UCL          |
|--------|-----------------|----------------------|----------|-----|--------------|
| LCS    | T070730022-LCS  | p-Bromofluorobenzene | 73.      | 77  | 120 Complete |
| LCSD   | T070730022-LCSD | p-Bromofluorobenzene | 72.      | 77  | 120 Complete |

### METHOD BLANK OUTLIERS:

There are no method blank outliers.

### LCS OUTLIERS:

There are no LCS outliers.

### MS/MSD and DUP OUTLIERS:

There are no MS/MSD or DUP outliers.

Test Method: ASTM D2216 - Pmoist - Solid

All method criteria was met for this test.

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0707088  
Project: RFTA  
Client: Waste Engineering, Inc.  
Client Project Number: none

## Report Section: Client Sample Report

Client Sample Name: W 0 @ 1.5'

Matrix: Soil

Collection Date: 7/11/2007 9:00:00AM

The following test was conducted by: Analytica - Thornton

Lab Sample Number: B0707088-01A  
Prep Date: 7/13/2007  
Analytical Method ID: 1664 FOR SOILS - Total  
Prep Method ID: 1664\_S  
Prep Batch Number: T070718009  
Report Basis: Dry Weight Basis  
Sample prep wt./vol: 50.05 g

Analysis Date: 7/13/2007 1:00:00PM  
Instrument: SCALE  
File Name:  
Dilution Factor: 1  
Percent Moisture: 2.50  
Analyst Initials: G. Yates/ L. Friedman  
Prep Extract Vol: 1.00 ml

| Analyte                     | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|-----------------------------|-------|--------|-------|-------|-----|-----|--------|
| Hexane-Extractable Material | na    | 310    |       | mg/Kg | 42  | 11  | 1      |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: B0707088-01B  
Prep Date: 7/25/2007  
Analytical Method ID: Aromatic VOCs by GC/PID via method 8021B - BTEX  
Prep Method ID: P&TSoil  
Prep Batch Number: T070730022  
Report Basis: Dry Weight Basis  
Sample prep wt./vol: 5.00 g

Analysis Date: 7/25/2007 9:29:00PM  
Instrument: GC\_B  
File Name: 07072507.D  
Dilution Factor: 1  
Percent Moisture: 2.50  
Analyst Initials: RA  
Prep Extract Vol: 5.00 ml

| Analyte        | CASNo     | Result | Flags | Units | PQL  | MDL  | run #: |
|----------------|-----------|--------|-------|-------|------|------|--------|
| Benzene        | 71-43-2   | ND     |       | ug/Kg | 0.51 | 0.14 | 1      |
| Ethylbenzene   | 100-41-4  | ND     |       | ug/Kg | 1.0  | 0.24 |        |
| Toluene        | 108-88-3  | ND     |       | ug/Kg | 1.0  | 0.20 |        |
| Xylenes, Total | 1330-20-7 | 2.6    |       | ug/Kg | 2.1  | 0.70 |        |

| Surrogate            | CASNo    | Result | Flags | Units | PQL  | MDL  | Spike | % Recov | LCL | UCL | run #: |
|----------------------|----------|--------|-------|-------|------|------|-------|---------|-----|-----|--------|
| p-Bromofluorobenzene | 460-00-4 | 21     |       | ug/Kg | 0.51 | 0.34 | 28    | 77.4    | 77  | 120 | 1      |



# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0707088

Project: RFTA

Client: Waste Engineering, Inc.

Client Project Number: none

## Report Section: Method Blank Report

Client Sample Name:

MB

Matrix: Solid

Collection Date: 7/13/2007 12:00:00AM

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T070718009-MB

Prep Date: 7/13/2007

Analytical Method ID: 1664 FOR SOILS - Total

Prep Method ID: 1664\_S

Prep Batch Number: T070718009

Report Basis: As Received

Sample prep wt./vol: 50.03 g

Analysis Date: 7/13/2007 1:00:00PM

Instrument: SCALE

File Name:

Dilution Factor: 1

Percent Moisture: NA

Analyst Initials: G. Yates/ L. Friedman

Prep Extract Vol: 1.00 ml

| Analyte                     | CASNo | Result | Flags | Units | PQL | MDL | run #: |
|-----------------------------|-------|--------|-------|-------|-----|-----|--------|
| Hexane-Extractable Material | na    | ND     |       | mg/Kg | 41  | 10  | 1      |

The following test was conducted by: Analytica - Thornton

Lab Sample Number: T070730022-MB

Prep Date: 7/25/2007

Analytical Method ID: Aromatic VOCs by GC/PID via method 8021B - BTEX

Prep Method ID: P&TSoil

Prep Batch Number: T070730022

Report Basis: As Received

Sample prep wt./vol: 5.00 g

Analysis Date: 7/25/2007 8:52:00PM

Instrument: GC\_B

File Name: 07072506.D

Dilution Factor: 1

Percent Moisture: NA

Analyst Initials: RA

Prep Extract Vol: 5.00 ml

| Analyte        | CASNo     | Result | Flags | Units | PQL  | MDL  | run #: |
|----------------|-----------|--------|-------|-------|------|------|--------|
| Benzene        | 71-43-2   | ND     |       | ug/Kg | 0.50 | 0.13 | 1      |
| Ethylbenzene   | 100-41-4  | ND     |       | ug/Kg | 1.0  | 0.23 |        |
| Toluene        | 108-88-3  | ND     |       | ug/Kg | 1.0  | 0.20 |        |
| Xylenes, Total | 1330-20-7 | ND     |       | ug/Kg | 2.0  | 0.68 |        |

| Surrogate            | CASNo    | Result | Flags | Units | PQL  | MDL  | Spike | % Recov | LCL | UCL | run #: |
|----------------------|----------|--------|-------|-------|------|------|-------|---------|-----|-----|--------|
| p-Bromofluorobenzene | 460-00-4 | 21     |       | ug/Kg | 0.50 | 0.33 | 27    | 78.2    | 77  | 120 | 1      |

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0707088

Project: RFTA

Client: Waste Engineering, Inc.

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): B0707088

Project: RFTA

Project Number:

### QUALITY CONTROL REPORT

Prep Batch: T070718009

#### LCS/LCSD REPORT

Analysis: 1664 FOR SOILS - Total

MB: T070718009-MB

Prep Date: 7/13/2007

MB Anal. Date: 7/13/2007 1:00:00PM

Units: mg/Kg

LCS Anal. Date: 7/13/2007 1:00:00PM LCSD Anal. Date: 7/13/2007 1:00:00PM Matrix: Solid

| Analyte Name                | SampResult | LCSRes. | SDRes. | SPLev | SPDLv | Recov. | SD Recov | RPD | Recov Lim | RPDLim | Flag |
|-----------------------------|------------|---------|--------|-------|-------|--------|----------|-----|-----------|--------|------|
| Hexane-Extractable Material | ND         | 782     | 790    | 800   | 800   | 97.8   | 98.8     | 1.0 | 61 - 133  | 20     |      |

#### MS/MSD REPORT

Analysis: 1664 FOR SOILS - Total

Parent: B0707088-01A

Prep Date: 7/13/2007

Samp. Anal. Date: 7/13/2007 1:00:00PM

Units: mg/Kg

MS Anal. Date: 7/13/2007 1:00:00PM MSD Anal. Date: 7/13/2007 1:00:00PM Matrix: Soil

| Analyte Name                | SampResult | MSRes. | MSDRes | SPLv | SPDLv | Recov. | MSD Rec. | RPD | Recov Lim | RPDLim | Flag |
|-----------------------------|------------|--------|--------|------|-------|--------|----------|-----|-----------|--------|------|
| Hexane-Extractable Material | 307        | 1,130  | 1,230  | 821  | 821   | 100.3  | 112.5    | 8.5 | 70 - 130  | 20     |      |

#### FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0707088

Project: RFTA

Client: Waste Engineering, Inc.

Client Project Number: none

Tests Run at: Analytica Environmental Laboratories - Thornton, Colorado

Workorder (SDG): B0707088

Project: RFTA

Project Number:

Prep Batch: T070730022

## QUALITY CONTROL REPORT

### LCS/LCSD REPORT

Analysis: Aromatic VOCs by GC/PID via method 8021B - BTEX

MB: T070730022-MB

Prep Date: 7/25/2007

MB Anal. Date: 7/25/2007 8:52:00PM

Units: ug/Kg

LCS Anal. Date: 7/25/2007 7:38:00PM LCSD Anal. Date: 7/25/2007 8:15:00PM Matrix: Solid

| Analyte Name   | SampResult | LCSRes. | SDRes. | SPLev | SPDLv | Recov. | SD Recov | RPD | Recov Lim | RPDLim | Flag |
|----------------|------------|---------|--------|-------|-------|--------|----------|-----|-----------|--------|------|
| Benzene        | ND         | 11.1    | 11.3   | 10.0  | 10.0  | 111.0  | 113.0    | 1.8 | 70 - 130  | 20     |      |
| Toluene        | ND         | 11.4    | 11.3   | 10.0  | 10.0  | 114.0  | 113.0    | 0.9 | 70 - 130  | 20     |      |
| Ethylbenzene   | ND         | 11.0    | 11.2   | 10.0  | 10.0  | 110.0  | 112.0    | 1.8 | 70 - 130  | 20     |      |
| Xylenes, Total | ND         | 34.3    | 34.7   | 30.0  | 30.0  | 114.3  | 115.7    | 1.2 | 70 - 130  | 20     |      |

### MS/MSD REPORT

|                |      |      |      |       |          |    |
|----------------|------|------|------|-------|----------|----|
| Benzene        | ND   | 12.9 | 10.3 | 125.8 | 70 - 130 | 20 |
| Toluene        | ND   | 12.8 | 10.3 | 124.8 | 70 - 130 | 20 |
| Ethylbenzene   | ND   | 12.2 | 10.3 | 119.0 | 70 - 130 | 20 |
| Xylenes, Total | 2.55 | 35.5 | 30.8 | 107.1 | 70 - 130 | 20 |

### FOOTNOTES TO QC REPORT

Note 1: Results are shown to three significant figures to avoid rounding errors in calculations.

Note 2: If the sample concentration is greater than 4 times the spike level, a recovery is not meaningful, and the result should be used as a replicate. In such cases the spike is not as high as expected random measurement variability of the sample result itself.

Note 3: For sample duplicates, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample and duplicate results are not five times the PQL or greater, then the RPD is not expected to fall within the window shown and the comparison should be made on the basis of the absolute difference. Analytica uses the criterion that the absolute difference should be less than the PQL for water or less than 2XPQL for other matrices.

Note 4: For serial dilutions, if the result is less than the PQL, the duplicate RPD is not applicable. If the sample result is not 50 times the MDL or greater, then the fact that the RPD does not meet the 10% criterion has little significance. Otherwise it indicates that a matrix bias may exist at the analytical step.

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0707088  
Project: RFTA  
Client: Waste Engineering, Inc.  
Client Project Number: none

## SURROGATE RECOVERY SUMMARY REPORT

Test Method: Aromatic VOCs by GC/PID via method 8021B - BTEX

|                      |                     |                |            |               |                      |
|----------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | B0707088-01B        | Dilution:      | 1          |               |                      |
| Analysis Date:       | 7/25/2007 9:29:00PM | Client Sample: | W 0 @ 1.5' |               |                      |
| Batch Number:        | T070730022          | Data File:     | 07072507.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 77                  | 77             | 120        |               | Complete             |

|                      |                      |                |            |               |                      |
|----------------------|----------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | B0707088-01B         | Dilution:      | 1          |               |                      |
| Analysis Date:       | 7/25/2007 10:05:00PM | Client Sample: | W 0 @ 1.5' |               |                      |
| Batch Number:        | T070730022           | Data File:     | 07072508.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>       | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 76                   | 77             | 120        | LOW           | Run                  |

|                      |                     |                |            |               |                      |
|----------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | T070730022-MB       | Dilution:      | 1          |               |                      |
| Analysis Date:       | 7/25/2007 8:52:00PM | Client Sample: | MB         |               |                      |
| Batch Number:        | T070730022          | Data File:     | 07072506.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 78                  | 77             | 120        |               | Complete             |

|                      |                     |                |            |               |                      |
|----------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | T070730022-LCS      | Dilution:      | 1          |               |                      |
| Analysis Date:       | 7/25/2007 7:38:00PM | Client Sample: | LCS        |               |                      |
| Batch Number:        | T070730022          | Data File:     | 07072504.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 73                  | 77             | 120        | LOW           | Complete             |

|                      |                     |                |            |               |                      |
|----------------------|---------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | T070730022-LCSD     | Dilution:      | 1          |               |                      |
| Analysis Date:       | 7/25/2007 8:15:00PM | Client Sample: | LCSD       |               |                      |
| Batch Number:        | T070730022          | Data File:     | 07072505.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>      | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 73                  | 77             | 120        | LOW           | Complete             |

|                      |                      |                |            |               |                      |
|----------------------|----------------------|----------------|------------|---------------|----------------------|
| Lab Sample #:        | B0707088-01B-MSD     | Dilution:      | 1          |               |                      |
| Analysis Date:       | 7/25/2007 11:19:00PM | Client Sample: | MSD        |               |                      |
| Batch Number:        | T070730022           | Data File:     | 07072510.D |               |                      |
| <u>AnalyteName</u>   | <u>SSRecov</u>       | <u>LCL</u>     | <u>UCL</u> | <u>SSFlag</u> | <u>Result Status</u> |
| p-Bromofluorobenzene | 80                   | 77             | 120        |               | Complete             |

# Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0707088  
Project: RFTA  
Client: Waste Engineering, Inc.  
Client Project Number: none

## QC BATCH ASSOCIATIONS - BY METHOD BLANK

Lab Project ID: 75,315 Lab Project Number: B0707088

Lab Method Blank Id: T070718006-MB Prep Date: 7/13/2007  
Prep Batch ID: T070718006  
Method: ASTM D2216 - Pmoist

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u>  |
|------------------|-------------------------|-----------------|----------------------|
| B0707051-01A     | Batch QC                |                 | 7/13/2007 10:50:00AM |
| B0707088-01A     | W 0 @ 1.5'              |                 | 7/13/2007 10:50:00AM |
| B0707051-01A-DUP | DUP                     |                 | 7/13/2007 10:50:00AM |

Lab Method Blank Id: T070718009-MB Prep Date: 7/13/2007  
Prep Batch ID: T070718009  
Method: 1664 FOR SOILS - Total

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u> |
|------------------|-------------------------|-----------------|---------------------|
| B0707088-01A     | W 0 @ 1.5'              |                 | 7/13/2007 1:00:00PM |
| T070718009-LCS   | LCS                     |                 | 7/13/2007 1:00:00PM |
| T070718009-LCSD  | LCSD                    |                 | 7/13/2007 1:00:00PM |
| B0707088-01A-MS  | MS                      |                 | 7/13/2007 1:00:00PM |
| B0707088-01A-MSD | MSD                     |                 | 7/13/2007 1:00:00PM |

Lab Method Blank Id: T070730022-MB Prep Date: 7/25/2007  
Prep Batch ID: T070730022  
Method: Aromatic VOCs by GC/PID via method 8021B - BTEX

This Method blank and sample preparation batch are associated with the following samples, spikes, and duplicates:

| <u>SampleNum</u> | <u>ClientSampleName</u> | <u>DataFile</u> | <u>AnalysisDate</u>  |
|------------------|-------------------------|-----------------|----------------------|
| T070730022-LCS   | LCS                     | 07072504.D      | 7/25/2007 7:38:00PM  |
| T070730022-LCSD  | LCSD                    | 07072505.D      | 7/25/2007 8:15:00PM  |
| B0707088-01B     | W 0 @ 1.5'              | 07072507.D      | 7/25/2007 9:29:00PM  |
| B0707088-01B-MSD | MSD                     | 07072510.D      | 7/25/2007 11:19:00PM |

## Detailed Analytical Report

Analytica Environmental Laboratories, Inc.

Workorder (SDG): B0707088

Project: RFTA

Client: Waste Engineering, Inc.

Client Project Number: none

### DATA FLAGS AND DEFINITIONS

The PQL is the Method Quantitation Limit as defined by USACE.

Reporting Limit: Limit below which results are shown as "ND". This may be the PQL, MDL, or a value between. See the report conventions below.

#### Result Field:

ND = Not Detected at or above the Reporting Limit

NA = Analyte not applicable (see Case Narrative for discussion)

#### Qualifier Fields:

LOW = Recovery is below Lower Control Limit

HIGH = Recovery, RPD, or other parameter is above Upper Control Limit

E = Reported concentration is above the instrument calibration upper range

#### Organic Analysis Flags:

B = Analyte was detected in the laboratory method blank

J = Analyte was detected above MDL or Reporting Limit but below the Quant Limit (PQL)

#### Inorganic Analysis Flags:

J = Analyte was detected above the Reporting Limit but below the Quant Limit (PQL)

W = Post digestion spike did not meet criteria

S = Reported value determined by the Method of Standard Additions (MSA)

Several ways of defining the limit of detection and quantitation are prevalent in the laboratory industry and may appear in Analytica reports. These include the following:

MRL = "minimum reporting level", from the EPA Safe Drinking Water program (SDW)

PQL = "practical quantitation limit", from SW-846

EQL = "estimated quantitation limit", from SW-846

LOQ = "limit of quantitation", from a number of authoritative sources

In Analytica's work, all of these terms have the same meaning, equivalent to the EPA definition of the MRL. This reporting level is supported by a satisfactory calibration data point which is at that level or lower, and also is supported by a method detection limit (MDL) determined by the procedure in 40CFR. The MDL is lower than the MRL and represents an estimate of the level where positive detections have a 99% probability of being real, but where quantitation accuracy is unknown.

The MRL as defined by Analytica is the lowest demonstrated point of known quantitation accuracy.

The MRL should not be confused with the MCL, which is the EPA-defined "maximum contaminant level" allowed for certain regulated targets under specific regulations, such as the National Primary Drinking Water Regulations. Normally, the MRL is set at a level which is much lower than the MCL in order to ensure that levels are well below those limits. Not all target analytes have MCL levels established.

Other Flags may be applied. See Case Narrative for Description

## Detailed Analytical Report

Workorder (SDG): B0707088

Analytica Environmental Laboratories, Inc.

Project: RFTA

Client: Waste Engineering, Inc.

Client Project Number: none

### REPORTING CONVENTIONS FOR THIS REPORT

B0707088

| <u>TestPkgName</u>                   | <u>Basis</u>     | <u># Sig Figs</u> | <u>Reporting Limit</u>          |
|--------------------------------------|------------------|-------------------|---------------------------------|
| 1664_S/SG/1664_S/SG (Solid) - Total  | Dry Weight Basis | 2                 | Report to PQL                   |
| 8021/5030B (Solid) - BTEX            | Dry Weight Basis | 2                 | Report to PQL                   |
| ASTMD2216/ASTMD2216 (Solid) - Pmoist | As Received      | 3                 | Report to MDL, J qual below PQL |





# Analytica Chain of Custody Form

12189 Pennsylvania St.  
Thornton, CO 80241  
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(303) 469-5254 fax

4307 Arctic Boulevard  
Anchorage, AK 99503  
(907) 258-2155  
(907) 258-6634 fax

475 Hall St.  
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(907) 456-3125 fax

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Juneau, AK 99801  
(907) 780-6666  
(907) 780-6870 fax

Page 1 of 1

Chain of Custody No: 60439

|                                                                      |  |                                                                                                                                                                     |  |
|----------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Client Name & Address:<br><b>WEI PO219</b><br><b>Glenwood Spring</b> |  | Public Water System (PWS) ID#:<br><b>RFTA</b>                                                                                                                       |  |
| Report to: <b>Heydenberk</b>                                         |  | Project Name:<br><b>RFTA</b>                                                                                                                                        |  |
| Phone No: <b>970 945-7757</b>                                        |  | Turnaround Time for Results (TAT)<br><b>Standard</b> Expedited (+10 days, prior authorization required)<br>(please specify due date below; add'l charges may apply) |  |
| Fax No: <b>970 945-7216</b>                                          |  | Invoice to Name & Address:<br><b>Jame</b>                                                                                                                           |  |
| E-mail:                                                              |  | Account #:<br><b>B0707088</b>                                                                                                                                       |  |
| Special Instructions/Comments:                                       |  | LGN:<br><b>B0707088</b>                                                                                                                                             |  |
|                                                                      |  | Quote ID:                                                                                                                                                           |  |
|                                                                      |  | Cash                                                                                                                                                                |  |
|                                                                      |  | Credit Card                                                                                                                                                         |  |

P.O. or Contract No: 972 022 000

| Client Sample Identification / Location |  |  |  | Date Sampled | Time Sampled | Matrix (S-DW-WW-Other) | No. of Containers | Requested Analysis/Method |  |  |  |  |  |  |  |  |  |
|-----------------------------------------|--|--|--|--------------|--------------|------------------------|-------------------|---------------------------|--|--|--|--|--|--|--|--|--|
| W02 112                                 |  |  |  | 7/11/07      | 9:00         | S                      | W                 | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Preserved           |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | Field Filtered            |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   | MS/MSD 2                  |  |  |  |  |  |  |  |  |  |
|                                         |  |  |  |              |              |                        |                   |                           |  |  |  |  |  |  |  |  |  |



# Cooler Receipt Form

Client: Waste Engineering, Inc.  
Project: RFTA

Client Code: 022120

Order #: B0707088

Cooler ID: 1

A. Preliminary Examination Phase:

Date cooler opened: 7/12/2007  
Cooler opened by: GP

Signature: [Signature]

1. Was airbill Attached? Yes

Airbill #: 861692557975

Carrier Name: FedEx

2. Custody Seals? No

How many? 0

Location:

Seal Name:

3. Seals intact? Yes

4. COC Attached? Yes

Properly Completed? Yes

Signed by AEL employee? Yes

5. Project Identification from custody paper: RFTA

6. Preservative: WetIce

Temperature: 3.3

Designated person initial here to acknowledge receipt:

[Signature] Date: 7/12/07

COMMENTS:

Log-In Phase:

Samples Log-In Date: 7/12/2007 Log-In By: LQ

1. Packing Type: Other

2. Were samples in separate bags? N/A

3. Were containers intact? Yes

Labels agree with COC? Yes

4. Number of bottles received: 3

Number of samples received: 1

5. Correct containers used? Yes

Correct preservatives added? Yes

6. Sufficient sample volume? Yes

7. Bubbles in VOA samples? N/A

8. Was Project manager called and status discussed? No

9. Was anyone called? No Who was called?

By whom?

Date:

COMMENTS:

**APPENDIX E - BOREHOLE LITHOLOGIC LOGS  
AND WELL COMPLETION**

Soil sampling involving Borings/Direct Push Points has not been performed at the Site or Requested by the OPS.

**APPENDIX F - WASTE DISPOSAL MANIFESTS**

Contaminated soil has not been generated at the site. Disposal has not occurred.

## APPENDIX G - SITE CLASSIFICATION CHECKLIST

A site characterization has not been completed. As a result the site classification tables cannot be completed at this time.

**CLASSIFICATION 1 - CURRENT THREAT TO HUMAN HEALTH , SAFETY, OR SENSITIVE ENVIRONMENT**

|  | R | N | U | SUB | Threat                                                                                                                                                                                                              | Response Action                                                                                                                                                                |
|--|---|---|---|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |   |   |   | 1.1 | Explosive levels, or concentrations of vapors that could cause acute health effects, are present in a residence or other building.                                                                                  | <i>Evacuate occupants, begin emergency abatement measures such as subsurface ventilation, or building pressurization or free product removal. Notify local fire authority.</i> |
|  |   |   |   | 1.2 | Explosive levels of vapors are present in subsurface utility system(s).                                                                                                                                             | <i>Evacuate vicinity immediately, begin emergency abatement measures such as ventilation.</i>                                                                                  |
|  |   |   |   | 1.3 | Free product is present in measurable quantities at ground surface, on surface water bodies, in utilities, or on surface water.                                                                                     | <i>Prevent further free product migration by appropriate containment measures, institute free product removal, restrict area access.</i>                                       |
|  |   |   |   | 1.4 | A water supply well, supply line, or surface intake is impacted** above action levels.                                                                                                                              | <i>Notify user(s) provide alternate water supply, control contaminated water and treat water at the point-of-use.</i>                                                          |
|  |   |   |   | 1.5 | Ambient vapor/particulate concentrations of concern from an acute exposure or safety viewpoint.                                                                                                                     | <i>Install a vapor barrier, remove the source, or restrict access to affected area.</i>                                                                                        |
|  |   |   |   | 1.6 | Surface water, storm water, or groundwater which is impacted** above action levels is discharging directly to a surface water body used for human drinking water or contact recreation, or a sensitive environment. | <i>Minimize extent of impact by containment measures, and implement habitat management to minimize exposures.</i>                                                              |

**CLASSIFICATION 2 - SHORT-TERM THREAT (0-6 MONTHS) TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB | Threat                                                                                                                                                                                                           | Response Action                                                                                                                                    |
|---|---|---|---|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|   |   |   |   | 2.1 | Explosive vapor levels, or concentrations that could cause acute health effects, may accumulate in a residence or other buildings within six months.                                                             | <i>Assess the potential for vapor migration through monitoring/modeling and remove source, if necessary, or install a vapor migration barrier.</i> |
|   |   |   |   | 2.2 | Surficial soils impacted** above action levels, are exposed and less than 500 ft from public access, dwellings, parks, sensitive environment, playgrounds, day care centers, schools, or similar use facilities. | <i>Remove soils, cover area, or restrict access.</i>                                                                                               |
|   |   |   |   | 2.3 | A water supply well producing from the affected groundwater is impacted** above action levels, or is located less than 120 ft* down-gradient of the known extent of contamination.                               | <i>Notify owner/user, evaluate need for point-of-use water treatment, hydraulic control, or alternative water supply.</i>                          |
|   |   |   |   | 2.4 | Groundwater is impacted** above action levels and a water supply well producing from a different interval is within the known extent of contamination.                                                           | <i>Notify owner, monitor groundwater well quality and determine need for prevention of vertical migration to the supply well.</i>                  |
|   |   |   |   | 2.5 | Surface water, storm water, or groundwater, impacted** above action levels, discharges within 500 ft of a surface water body used for human drinking water or contact recreation, or a sensitive environment.    | <i>Begin containment measures. Restrict access to areas near discharge. Evaluate magnitude and impact to discharge area.</i>                       |
|   |   |   |   | 2.6 | Free product, of any measurable thickness on groundwater is discovered.                                                                                                                                          | <i>Prevent free product migration by appropriate containment measures. Begin free product removal immediately.</i>                                 |
|   |   |   |   | 2.7 | Groundwater impacted** above action levels is present offsite.                                                                                                                                                   | <i>Define extent and degree of contamination. Notify OIS of name and address of impacted parties.</i>                                              |

**CLASSIFICATION 2a - INTERMEDIATE-TERM THREAT (7-24 MONTHS) TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB  | Threat                                                                                                                                                                                               | Response Action                                                                                                                                     |
|---|---|---|---|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|   |   |   |   | 2a.1 | Explosive vapor levels, or concentrations that could cause acute health effects may accumulate in a residence or other buildings within seven to twenty four months.                                 | <i>Assess the potential for vapor migration, through monitoring/modeling and remove source, if necessary, or install a vapor migration barrier.</i> |
|   |   |   |   | 2a.2 | Groundwater is impacted** above action levels and a water supply well producing from the impacted interval is located between 120 ft and 500 ft* down-gradient of the known extent of contamination. | <i>Notify owner/user, evaluate need for point-of-use water treatment, hydraulic control, or alternate water supply.</i>                             |



**CLASSIFICATION 3 - LONG-TERM THREAT (>2 YEARS) TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB | Threat                                                                                                                                                                                                      | Response Action                                                                                                                                                                      |
|---|---|---|---|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |   |   |   | 3.1 | Subsurface soils (> 3 ft bgs) are impacted** above action levels, and depth from impacted soils to the first groundwater is less than 50 ft.                                                                | Define the extent of contamination. Monitor groundwater. Determine the potential for future contaminant migration to the groundwater.                                                |
|   |   |   |   | 3.2 | Groundwater is impacted** above action levels onsite with the potential to migrate offsite.                                                                                                                 | Define the extent of contamination. Monitor groundwater. Determine the potential for future contaminant migration to the groundwater at the property boundary.                       |
|   |   |   |   | 3.3 | Groundwater is impacted** above action levels, and water supply wells producing from the impacted interval are located between 500 ft and ½ mile* down gradient of the known extent of contamination.       | Define extent of contamination. Monitor the dissolved plume and evaluate the potential for future contaminant migration, for natural attenuation and the need for hydraulic control. |
|   |   |   |   | 3.4 | Surface water, storm water, or groundwater impacted** above action levels, discharges within 1500 ft of a surface water body used for human drinking water or contact recreation, or sensitive environment. | Investigate potential impact on sensitive environment or surface water body, restrict access to area of discharge and evaluate the need for containment/controls measures.           |

**CLASSIFICATION 4 - NO DEMONSTRABLE LONG-TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENT**

| T | R | N | U | SUB | Threat                                                                                                                                                                                                                                   | Response Action                                                                              |
|---|---|---|---|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
|   |   |   |   | 4.1 | Impacted** soils above action levels are located more than 3 ft bgs and are greater than 50 ft above the nearest groundwater.                                                                                                            | Monitor groundwater and evaluate effect of natural attenuation on leachate migration.        |
|   |   |   |   | 4.2 | Groundwater is impacted** above action levels and water supply wells that do not produce from the impacted interval are located downgradient outside the known extent of contamination.                                                  | Monitor groundwater and evaluate effect of natural attenuation on dissolved plume migration. |
|   |   |   |   | 4.3 | Surficial soils impacted** above action levels are exposed and greater than 500 ft from public access, dwellings, parks, sensitive environments, sensitive resources, playgrounds, day care centers, schools, or similar use facilities. | Restrict access to affected soils.                                                           |

\* These distances are based on conservative assumptions for groundwater flow velocity. These distances can be adjusted provided supporting documentation is submitted to and approved by the OIS.

\*\*If the extent of contamination has not been defined the owner/operator must assume that all potential POEs are within the impacted area.

## APPENDIX H - SUPPORTING DOCUMENTATION

Reported laboratory results are included in Appendix D.

BILL RITTER, JR  
Governor  
DONALD J. MARES  
Executive Director  
RICHARD O. PIPER  
Division Director



USGARRoA 005  
**DEPARTMENT OF LABOR AND EMPLOYMENT**

**Division of Oil and Public Safety**  
**Remediation Section**  
633 17<sup>th</sup> Street, Suite 500  
Denver, Colorado 80202-3660  
(303) 318-8500; Fax (303) 318-8546  
Website: <http://oil.cdle.state.co.us>

**FILE COPY**

November 14, 2007

**RUSS DECKER**  
**ROARING FORK TRANSPORTATION AUTHORITY**  
**0051 SERVICE CENTER DRIVE**  
**ASPEN CO 81611**

Re: The suspected release during the replacement of overfill protection at the Roaring Fork Transportation Authority, 2307 Wulfsohn Rd., Glenwood Springs, Garfield County, Colorado. (Event ID 10428)

Dear Mr. Decker:

The Division of Oil and Public Safety (OPS) has reviewed the Site Characterization Report for the above referenced site that was received on October 25, 2007.

Based solely upon the information submitted, which shows that contamination levels are below state cleanup levels, OPS does not require any further investigation or remedial action at this time. If conditions change, OPS reserves the right to determine if any additional actions are necessary. This no further action (NFA) letter is in reference to the suspected release during the replacement of overfill protection.

**OPS cannot release you from any liability that may be associated with any contamination at or from this site.**

Please address correspondence regarding this site to me. If you have any questions call me at (303) 318-8524.

Sincerely,

A handwritten signature in cursive script, appearing to read "Tina Sandoval".

Tina Sandoval  
Remediation Technician  
Remediation Section

A handwritten signature in cursive script, appearing to read "TR Kelley".

TR Kelley  
Environmental Protection Specialist  
Remediation Section

cc: Laura Smith, P.E., Remediation Section Manager  
Craig Heydenberk, Waste Engineering, Inc., P.O. Box 219, Glenwood Springs, CO 81611



November 11, 2019

David Sarno  
Petroleum Equipment Sales and Service, Inc  
P.O. Box 1818  
Glenwood Springs, Colorado 81602

**Subject: Spill Bucket Repair Assessment,  
RFTA Maintenance Facility, Glenwood Springs CO**

Dear Mr. Sarno:

On November 6, 2019, Palisades Technology and Management, LLC (PTM) conducted a limited assessment at the Roaring Fork Transit Authority (RFTA) maintenance facility located at 2301 Wulfsohn Road in Glenwood Springs, Colorado. This assessment was performed in conjunction with repairs to the spill buckets on three underground storage tanks (USTs) at the site.

During testing of the spill buckets, it was reported that the bucket on the oil UST test failed and testing could not be performed on the unleaded or diesel spill buckets as the fill pipe could not be removed. Due to these uncertainties, PTM was onsite during the repair work to assess the potential for a release.

The PTM representative observed the excavation of the fill pipe and spill bucket of the three USTs and performed visual inspection and screening of soils with a photoionization detector (PID) to assess the potential for a release of petroleum products to the subsurface. No stained soils or odors were noted surrounding or under the spill bucket on the three USTs. PID readings from soil (tank bedding) collected during excavation activities was non-detect for organic vapors. Additionally, a visual inspection of the top of the oil UST was performed due to the failure of the spill bucket. No evidence of a release of oil was observed on the top of the tank or in tank bedding between the spill bucket and the top of the tank.

No additional action is required by RFTA as no evidence of a release was observed during the limited assessment. If you have questions or concerns, please contact the undersigned.

Sincerely,

A handwritten signature in blue ink that reads "David M Cox".

David Cox  
President  
Palisades Technology and Management, LLC  
palisadestech@gmail.com





Colorado Department of Labor and Employment  
Division of Oil and Public Safety - Compliance Section  
633 17<sup>th</sup> Street, Suite 500  
Denver, CO 80202-3610

Phone: 303-318-8525  
Email: [cdle\\_oil\\_inspection@state.co.us](mailto:cdle_oil_inspection@state.co.us)  
Web: [www.colorado.gov/ops](http://www.colorado.gov/ops)

## Minor Equipment Repair/Replacement Notification

(Revised 5/8/2019)

Submit this form, including the completed OPS Secondary Containment/Spill Container Testing form and/or precision line tightness test results to OPS within 7 days after replacement/testing.

### Facility Information

|                    |                  |               |                |                |            |
|--------------------|------------------|---------------|----------------|----------------|------------|
| Facility Name:     | RFTA             |               | Facility ID #: | 15558          |            |
| Facility Address:  | 2307 Welfeshm Rd |               | City:          | Glenwood SP    | ZIP: 81601 |
| A/B Operator Name: |                  | Phone Number: |                | Email Address: |            |

### Installer/Qualified Service Technician (QST) Information

|                               |                                   |               |                 |                       |                     |
|-------------------------------|-----------------------------------|---------------|-----------------|-----------------------|---------------------|
| Company Name:                 | Petrol. Equipment Sales & Service |               |                 |                       |                     |
| Address:                      | PO Box 1818                       |               | City/State/ZIP: | Glenwood SP, CO 81602 |                     |
| Contact Name:                 | DAVID SARNO                       | Phone Number: | 9703298698      | Email Address:        | DAVID.SARNO@AOL.COM |
| Certified Installer/QST Name: | DAVID SARNO                       |               |                 | Installer/QST ID #:   |                     |

### Work Performed

|                                                                                                                                                                                       |            |          |          |     |     |     |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------|----------|-----|-----|-----|-----|
| Description:                                                                                                                                                                          |            |          |          |     |     |     |     |
| <input type="checkbox"/> Repair OR <input checked="" type="checkbox"/> Replace existing spill containment at fill or vapor recovery connection                                        |            |          |          |     |     |     |     |
| <input type="checkbox"/> Repair OR <input type="checkbox"/> Replace existing overfill protection device with dissimilar type                                                          |            |          |          |     |     |     |     |
| <input type="checkbox"/> Repair OR <input type="checkbox"/> Replace existing <input type="checkbox"/> UDC OR <input type="checkbox"/> STP OR <input type="checkbox"/> Transition sump |            |          |          |     |     |     |     |
| OPS Tank ID #                                                                                                                                                                         | 15558-1    | 15558-2  | 15558-4  |     |     |     |     |
| Capacity                                                                                                                                                                              | 15,000 gal | 6000 gal | 4000 gal | gal | gal | gal | gal |
| Product Stored in Tank                                                                                                                                                                | Piesol     | UNL GAS  | OIL      |     |     |     |     |
| Spill Containment Location                                                                                                                                                            |            |          |          |     |     |     |     |
| Spill Containment Wall Type                                                                                                                                                           | D          | D        | D        |     |     |     |     |
| Spill Containment Size                                                                                                                                                                | 5 gal      | 5 gal    | 5 gal    | gal | gal | gal | gal |
| Overfill Prevention Device                                                                                                                                                            | FILL VALVE | FV       | FV       |     |     |     |     |
| Containment Sump Type                                                                                                                                                                 | N/A        | N/A      | N/A      |     |     |     |     |
| Sump Wall Type                                                                                                                                                                        |            |          |          |     |     |     |     |
| Containment Sump Manufacturer                                                                                                                                                         |            |          |          |     |     |     |     |
| Piping Type                                                                                                                                                                           | Wall       |          |          |     |     |     |     |
|                                                                                                                                                                                       | Material   |          |          |     |     |     |     |

Where product piping has been altered, cut or disassembled and removed to allow replacement of containment sumps, show amount replaced below.

Piping must be precision tightness tested following repair and before returning to service.

|                                |    |    |    |    |    |    |    |
|--------------------------------|----|----|----|----|----|----|----|
| Piping Length Removed/Replaced | ft | ft | ft | ft | ft | ft | ft |
|--------------------------------|----|----|----|----|----|----|----|

### Checklist

| Item                                                                                                                                                                            | Date Completed | N/A                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------|
| Date repair/replacement work was completed                                                                                                                                      | 11/12/2019     |                          |
| If a release has occurred, a report must be made to OPS within 24 hours of discovery by calling 303-318-8547.                                                                   |                | <input type="checkbox"/> |
| Has spill containment/sumps been tested hydrostatically or using another approved method with pass results? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |                |                          |
| Has piping been precision tightness tested following repair and before returning to service with pass results? <input type="checkbox"/> Yes <input type="checkbox"/> No         |                | <input type="checkbox"/> |

### Certification Information

I certify under penalty of law that the information provided here and in supporting documents is true, accurate and complete.

|                     |             |                          |                    |       |          |
|---------------------|-------------|--------------------------|--------------------|-------|----------|
| Installer/QST Name: | DAVID SARNO | Installer/QST Signature: | <i>David Sarno</i> | Date: | 11/12/19 |
|---------------------|-------------|--------------------------|--------------------|-------|----------|

Installer and/or Qualified Service Technician (QST) Contact Information must be provided.





Colorado Department of Labor and Employment  
Division of Oil and Public Safety - Compliance Section  
633 17<sup>th</sup> Street, Suite 500  
Denver, CO 80202-3610

Phone: 303-318-8525  
Email: [cdle\\_oil\\_inspection@state.co.us](mailto:cdle_oil_inspection@state.co.us)  
Web: [www.colorado.gov/ops](http://www.colorado.gov/ops)

## Secondary Containment and Spill Prevention Equipment Tightness Testing

(Revised 5/8/2019)

OPS Facility ID: 15558 OPS Installation #:                      ☐ Minor Equipment or N/A Installation Date: 11/12/19

| Facility Information |                         | Installer Information         |                             |
|----------------------|-------------------------|-------------------------------|-----------------------------|
| Facility Name:       | <u>RFTA</u>             | Company Name:                 | <u>Petrol. Equip Sales</u>  |
| Address:             | <u>2307 Welford Rd</u>  | Address:                      | <u>PO Box 1818</u>          |
| City/State/ZIP:      | <u>GWS, CO 81601</u>    | City/State/ZIP:               | <u>GWS, CO 81602</u>        |
| A/B Operator Name:   | <u>Scott Keegan</u>     | OPS Certified Installer Name: | <u>DAVID SARNES</u>         |
| Phone #:             | <u>970 412 3907</u>     | Phone #:                      | <u>(970) 379 8698</u>       |
| Email Address:       | <u>SKeegan@RFTA.com</u> | Email Address:                | <u>DAVID.SARNES@AOL.COM</u> |

### Secondary Containment Present at Site (check all that apply)

- ☐ DW Tanks ☐ DW Piping ☒ Spill Buckets/Spill Containers  
☐ STP/Piping Sump Containment ☐ Under-Dispenser Containment ☐ Fill Riser Containment

#### DW Tanks (Annular Testing)

|                                   |  |  |  |  |  |
|-----------------------------------|--|--|--|--|--|
| OPS Tank # Assigned               |  |  |  |  |  |
| Test Method Used                  |  |  |  |  |  |
| If 'Other' - Describe Test Method |  |  |  |  |  |
| Test Equipment Mfr./Model         |  |  |  |  |  |
| Test Start Time                   |  |  |  |  |  |
| Initial Reading                   |  |  |  |  |  |
| Test End Time                     |  |  |  |  |  |
| Final Reading                     |  |  |  |  |  |
| Change in Readings                |  |  |  |  |  |
| Pass/Fail Threshold/Criteria      |  |  |  |  |  |
| Result                            |  |  |  |  |  |

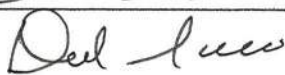
#### DW Piping (Secondary Testing)

|                                   |  |  |  |  |  |
|-----------------------------------|--|--|--|--|--|
| OPS Tank # Assigned               |  |  |  |  |  |
| Test Method Used                  |  |  |  |  |  |
| If 'Other' - Describe Test Method |  |  |  |  |  |
| Test Equipment Mfr./Model         |  |  |  |  |  |
| Test Start Time                   |  |  |  |  |  |
| Initial Reading                   |  |  |  |  |  |
| Test End Time                     |  |  |  |  |  |
| Final Reading                     |  |  |  |  |  |
| Change in Readings                |  |  |  |  |  |
| Pass/Fail Threshold/Criteria      |  |  |  |  |  |
| Result                            |  |  |  |  |  |

#### Spill Buckets/Spill Containers

|                                   |                  |                  |                  |  |  |
|-----------------------------------|------------------|------------------|------------------|--|--|
| OPS Tank # Assigned               | <u>15558-1</u>   | <u>15558-2</u>   | <u>15558-4</u>   |  |  |
| Test Method Used                  | <u>HYDRO</u>     | <u>HYDRO</u>     | <u>HYDRO</u>     |  |  |
| If 'Other' - Describe Test Method |                  |                  |                  |  |  |
| Test Equipment Mfr./Model         |                  |                  |                  |  |  |
| Test Start Time                   | <u>11:00</u>     | <u>11:10</u>     | <u>11:20</u>     |  |  |
| Initial Reading                   | <u>12 1/4"</u>   | <u>12"</u>       | <u>12 1/8"</u>   |  |  |
| Test End Time                     | <u>12:00</u>     | <u>12:10</u>     | <u>12:20</u>     |  |  |
| Final Reading                     | <u>12 1/4"</u>   | <u>12"</u>       | <u>12 1/8"</u>   |  |  |
| Change in Readings                | <u>0</u>         | <u>0</u>         | <u>0</u>         |  |  |
| Pass/Fail Threshold/Criteria      | <u>&lt; 1/8"</u> | <u>&lt; 1/8"</u> | <u>&lt; 1/8"</u> |  |  |
| Result                            | <u>PASS</u>      | <u>PASS</u>      | <u>PASS</u>      |  |  |



| STP/Piping Sump Containment                                                                                                                                                                                                                                                                 |                |                      |                                                                                      |                                                                     |       |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------|----------|
| OPS Tank # Assigned                                                                                                                                                                                                                                                                         |                |                      |                                                                                      |                                                                     |       |          |
| Test Method Used                                                                                                                                                                                                                                                                            |                |                      |                                                                                      |                                                                     |       |          |
| If 'Other' - Describe Test Method                                                                                                                                                                                                                                                           |                |                      |                                                                                      |                                                                     |       |          |
| Test Equipment Mfr./Model                                                                                                                                                                                                                                                                   |                |                      |                                                                                      |                                                                     |       |          |
| Test Start Time                                                                                                                                                                                                                                                                             |                |                      |                                                                                      |                                                                     |       |          |
| Initial Reading                                                                                                                                                                                                                                                                             |                |                      |                                                                                      |                                                                     |       |          |
| Test End Time                                                                                                                                                                                                                                                                               |                |                      |                                                                                      |                                                                     |       |          |
| Final Reading                                                                                                                                                                                                                                                                               |                |                      |                                                                                      |                                                                     |       |          |
| Change in Readings                                                                                                                                                                                                                                                                          |                |                      |                                                                                      |                                                                     |       |          |
| Pass/Fail Threshold/Criteria                                                                                                                                                                                                                                                                |                |                      |                                                                                      |                                                                     |       |          |
| Result                                                                                                                                                                                                                                                                                      |                |                      |                                                                                      |                                                                     |       |          |
| Under-Dispenser Containment                                                                                                                                                                                                                                                                 |                |                      |                                                                                      |                                                                     |       |          |
| UDC #                                                                                                                                                                                                                                                                                       |                |                      |                                                                                      |                                                                     |       |          |
| Test Method Used                                                                                                                                                                                                                                                                            |                |                      |                                                                                      |                                                                     |       |          |
| If 'Other' - Describe Test Method                                                                                                                                                                                                                                                           |                |                      |                                                                                      |                                                                     |       |          |
| Test Equipment Mfr./Model                                                                                                                                                                                                                                                                   |                |                      |                                                                                      |                                                                     |       |          |
| Test Start Time                                                                                                                                                                                                                                                                             |                |                      |                                                                                      |                                                                     |       |          |
| Initial Reading                                                                                                                                                                                                                                                                             |                |                      |                                                                                      |                                                                     |       |          |
| Test End Time                                                                                                                                                                                                                                                                               |                |                      |                                                                                      |                                                                     |       |          |
| Final Reading                                                                                                                                                                                                                                                                               |                |                      |                                                                                      |                                                                     |       |          |
| Change in Readings                                                                                                                                                                                                                                                                          |                |                      |                                                                                      |                                                                     |       |          |
| Pass/Fail Threshold/Criteria                                                                                                                                                                                                                                                                |                |                      |                                                                                      |                                                                     |       |          |
| Result                                                                                                                                                                                                                                                                                      |                |                      |                                                                                      |                                                                     |       |          |
| Fill Riser Containment                                                                                                                                                                                                                                                                      |                |                      |                                                                                      |                                                                     |       |          |
| OPS Tank # Assigned                                                                                                                                                                                                                                                                         |                |                      |                                                                                      |                                                                     |       |          |
| Test Method Used                                                                                                                                                                                                                                                                            |                |                      |                                                                                      |                                                                     |       |          |
| If 'Other' - Describe Test Method                                                                                                                                                                                                                                                           |                |                      |                                                                                      |                                                                     |       |          |
| Test Equipment Mfr./Model                                                                                                                                                                                                                                                                   |                |                      |                                                                                      |                                                                     |       |          |
| Test Start Time                                                                                                                                                                                                                                                                             |                |                      |                                                                                      |                                                                     |       |          |
| Initial Reading                                                                                                                                                                                                                                                                             |                |                      |                                                                                      |                                                                     |       |          |
| Test End Time                                                                                                                                                                                                                                                                               |                |                      |                                                                                      |                                                                     |       |          |
| Final Reading                                                                                                                                                                                                                                                                               |                |                      |                                                                                      |                                                                     |       |          |
| Change in Readings                                                                                                                                                                                                                                                                          |                |                      |                                                                                      |                                                                     |       |          |
| Pass/Fail Threshold/Criteria                                                                                                                                                                                                                                                                |                |                      |                                                                                      |                                                                     |       |          |
| Result                                                                                                                                                                                                                                                                                      |                |                      |                                                                                      |                                                                     |       |          |
| Was an OPS inspector present during testing?                                                                                                                                                                                                                                                |                |                      |                                                                                      | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |       |          |
| Was a completed copy of the manufacturer's installation checklist received?                                                                                                                                                                                                                 |                |                      |                                                                                      | <input type="checkbox"/> Yes <input type="checkbox"/> No            |       |          |
| Inspector Name:                                                                                                                                                                                                                                                                             |                | Inspector Signature: |                                                                                      |                                                                     | Date: |          |
| Certification Information                                                                                                                                                                                                                                                                   |                |                      |                                                                                      |                                                                     |       |          |
| I certify under penalty of law that the information provided here and in supporting documents is true, accurate and complete.<br>Note: When an OPS inspector is not present, this form must be signed by the tester <i>and</i> Qualified Service Technician (QST) before submitting to OPS. |                |                      |                                                                                      |                                                                     |       |          |
| Tester Name:                                                                                                                                                                                                                                                                                | DAVID SAKKO    | Tester Signature:    |  |                                                                     | Date: | 11/12/19 |
| QST Name:                                                                                                                                                                                                                                                                                   | 11             | QST Signature:       |  |                                                                     | Date: | 11/12/19 |
| OPS Use:                                                                                                                                                                                                                                                                                    | Date Reviewed: |                      | Reviewed by:                                                                         |                                                                     |       |          |





**COLORADO**  
Division of Oil and Public Safety  
Department of Labor and Employment

**Remediation Program**  
633 17th Street, Suite 500  
Denver, CO 80202-3660  
303-318-8547 | [colorado.gov/ops](http://colorado.gov/ops) | [cdle\\_remediation@state.co.us](mailto:cdle_remediation@state.co.us)

March 6, 2020

VIA EMAIL: [ahenderson@rfta.com](mailto:ahenderson@rfta.com)

Angela Henderson  
Roaring Fork Transportation Authority  
1340 Main Street  
Carbondale, CO 81623

Re: No Further Action (NFA) Determination for RFTA-Roaring Fork Transit Agency, 2307 Wulfsohn Road, Glenwood Springs, Garfield County, Colorado. (Event ID 13464, Facility ID 15558)

Dear Ms. Henderson:

The Division of Oil and Public Safety (OPS) has reviewed the NFA request for the referenced site received on February 26, 2020.

Based solely upon the information submitted regarding the diesel, regular unleaded, and lube oil spill buckets that failed hydrostatic testing (15558-1, 15558-2, 15558-3), OPS will require no further action at this time. If conditions change, OPS reserves the right to determine if any additional actions are necessary. This NFA letter is in reference to the confirmed release reported to OPS on August 14, 2019.

**OPS cannot release you from any liability that may be associated with any contamination at or from this site.**

Please address correspondence regarding this site to me and if you have any questions, please contact me at 303-318-8519 or via email at [hannah.phillips@state.co.us](mailto:hannah.phillips@state.co.us).

Sincerely,

*K. Hannah Williams*

K. Hannah Williams  
Environmental Protection Specialist  
Petroleum Program





## Department of Labor and Employment Division of Oil and Public Safety

### Remediation Section

633 17th Street, Suite 500

Denver, CO 80202-3660

303-318-8547 (technical assistance)

Website: [www.colorado.gov/ops/remediation](http://www.colorado.gov/ops/remediation)

*Select a report title from the list:*

## SCR - No Further Action Request

Facility ID: 15748  
Event ID: 13987  
Reporting Period: Qtr 1  
Year: 2021  
Submittal Date: July 30, 2021

SCR submitted: July 30, 2021  
Date last CAP approved:   
Date CAP scope ends:

March 5, 2019  
Version 2.0.3

**AST Closure Narrative  
Former Glenwood Springs Municipal Operations Center  
2301 Wulfsohn Road, Glenwood Springs, Colorado  
Event ID: 13987, Facility ID: 15748**

**Introduction**

ERO Resources Corporation (ERO) has completed this narrative, on behalf of the Roaring Fork Transportation Authority (RFTA), to document ERO's oversight of the removal of an aboveground storage tank (AST) and two fuel dispensers from the former City of Glenwood Springs Municipal Operation Center (MOC) located at 2301 Wulfsohn Road in Glenwood Springs, Colorado (hereafter referred to as "the facility"). The facility location is shown on Figure 1 and Figure 2. The narrative also discusses sample results from soil samples collected at these features to determine if there were releases from historical operations. Figure 3 shows the locations of the soil samples collected.

The AST was a dual-compartment, concrete encased tank located on a concrete pad southwest of the former MOC building. The AST consisted of two 6,000-gallon compartments, one for unleaded gasoline and one for diesel. Product flowlines ran from the tanks aboveground to two dispensers just south of the tank. The concrete pad was surrounded by asphalt.

**Soil Sampling**

**Aboveground Storage Tank:** On January 12, 2021, in order to determine if there had been a release from the tanks, ERO had American Demolition, Inc. (ADI), the demolition contractor of the facility, excavate holes about two feet deep at the edges of the concrete pad on either side of each tank compartment and at the north end of the pad for a total of five samples. ERO then collected soil samples of native soils beneath the concrete pad and road base. The soils in each hole were also screened with the photoionization detector (PID). No evidence of a release from the tanks, such as staining, odors, or PID detections, was noted.

**Fuel Dispensers:** On January 27, 2021, ADI removed the two fuel dispensers and the concrete island they were mounted to and ERO collected native soil samples from beneath where the dispensers had been. The soils were also screened with the PID. No evidence of releases from beneath the fuel dispensers, such as staining, odors, or PID detections, was noted.

**Soil Sample Analysis**

The soil samples were placed in iced coolers and delivered under chain-of-custody to SGS Mountain States Laboratory for analysis. The AST samples were analyzed for benzene,

Denver  
1842 Clarkson St.  
Denver, CO 80218  
303.830.1188

Durango  
1015 ½ Main Avenue  
Durango, CO 81301  
970.422.2136

Hotchkiss  
P.O. Box 932  
161 South 2<sup>nd</sup> St.  
Hotchkiss, CO 81419  
970.872.3020

Idaho  
4001 East Main Street  
Emmett, ID 83617  
208.365.7684

toluene, ethylbenzene, and xylenes (BTEX) and gasoline range organics (GRO) by EPA Method 8260, and diesel-range organics (DRO) and oil-range organics (ORO) by EPA Method 8015. The fuel dispenser samples were analyzed for BTEX, GRO, and methyl tert-butyl ether (MTBE) by Method 8260 and DRO by Method 8015. The laboratory analytical reports are attached (note that the reports include results for soil samples from other features at the facility not related to this AST closure).

### **Soil Sample Results**

Aboveground Storage Tank: No BTEX compounds or GRO were detected in any of the AST samples and low concentrations of DRO and ORO were detected in all five AST samples at combined concentrations of between 60.2 and 110.2 mg/kg, well below the Tier 1 Risk Based Screening Level (RBSL) of 500 milligrams per kilogram (mg/kg).

Fuel Dispensers: No BTEX, GRO, MTBE, and DRO concentrations were detected above the laboratory reporting limit in either dispenser sample.

### **Tank Removal**

The AST was removed from the facility on February 4, 2021 by loading it onto a flatbed truck and transporting it to Gould Construction, Inc. in Glenwood Springs, Colorado to be reused.

### **Conclusions**

Based on the soil sample results and observations, it is ERO's professional opinion that any historical release from the AST has not resulted in soil contamination exceeding the RBSLs. Therefore, on behalf of RFTA, ERO requests No Further Action for the facility.

## Site Information

Event ID: 13987

Reporting Period: Qtr 1

Year: 2021

| SITE INFORMATION                                                                                                                         |                                       |         |                                            |                          |                        |
|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------|--------------------------------------------|--------------------------|------------------------|
| Site Name:                                                                                                                               | Glenwood Municipal Operations Center  |         | Business on Site:                          | Formerly a repair garage |                        |
| Site Address:                                                                                                                            | 2301 Wulfsohn Rd.                     |         |                                            |                          |                        |
| City:                                                                                                                                    | Glenwood Springs                      | County: | Garfield                                   | Zip Code:                | 81601                  |
| Latitude:                                                                                                                                | 39° 33' 21"                           |         | Longitude:                                 | 107° 21' 22"             |                        |
| PROPERTY OWNER INFORMATION                                                                                                               |                                       |         |                                            |                          |                        |
| Name:                                                                                                                                    | Roaring Fork Transportation Authority |         |                                            |                          |                        |
| Address:                                                                                                                                 | 2307 Wulfsohn Rd.                     |         |                                            |                          |                        |
| City:                                                                                                                                    | Glenwood Springs                      | State:  | CO                                         | Zip Code:                | 81601                  |
| Phone Number:                                                                                                                            | 970-384-4862                          |         | Fax Number:                                |                          |                        |
| Contact Person:                                                                                                                          | Nicholas Senn                         |         | Email:                                     | nsenn@rfta.com           |                        |
| RESPONSIBLE PARTY INFORMATION                                                                                                            |                                       |         |                                            |                          |                        |
| Name:                                                                                                                                    | Same as above                         |         |                                            |                          |                        |
| Address:                                                                                                                                 |                                       |         |                                            |                          |                        |
| City:                                                                                                                                    |                                       | State:  |                                            | Zip Code:                |                        |
| Phone Number:                                                                                                                            |                                       |         | Fax Number:                                |                          |                        |
| Contact Person:                                                                                                                          |                                       |         | Email:                                     |                          |                        |
| ENVIRONMENTAL CONSULTANT INFORMATION                                                                                                     |                                       |         |                                            |                          |                        |
| Name:                                                                                                                                    | ERO Resources Corp.                   |         |                                            |                          |                        |
| Address:                                                                                                                                 | 1842 Clarkson St.                     |         |                                            |                          |                        |
| City:                                                                                                                                    | Denver                                | State:  | CO                                         | Zip Code:                | 80218                  |
| Phone Number:                                                                                                                            | 303-830-1188                          |         | Fax Number:                                | (303) 830-1199           |                        |
| Project Mgr:                                                                                                                             | Craig Sovka                           |         | Email:                                     | csovka@eroresources.com  |                        |
| REP:                                                                                                                                     |                                       |         | Email:                                     |                          |                        |
| RELEASE INFORMATION                                                                                                                      |                                       |         |                                            |                          |                        |
| Date Release was Suspected                                                                                                               |                                       |         | Date OPS was notified of suspected release |                          |                        |
| Date Release was Confirmed                                                                                                               | 1/21/2021                             |         | Date OPS was notified of confirmed release | 2/26/2021                |                        |
| Product Released:                                                                                                                        | diesel                                |         | How was Release Discovered:                | Tank Closure - Removal   |                        |
| Source of Release:                                                                                                                       | Tank                                  |         | Quantity in Gallons:                       | Unknown                  |                        |
| Cause of Release:                                                                                                                        | Other                                 |         |                                            |                          |                        |
| Provide Brief Description of System Repair:                                                                                              | No repairs. The tank was removed.     |         |                                            |                          |                        |
| PREVIOUS RELEASE INFORMATION                                                                                                             |                                       |         |                                            |                          |                        |
| Date of Prior Release                                                                                                                    | Event ID                              | Product | Quantity (Gallons)                         | Source of Release        | Date NFA Letter Issued |
|                                                                                                                                          |                                       |         |                                            |                          |                        |
|                                                                                                                                          |                                       |         |                                            |                          |                        |
|                                                                                                                                          |                                       |         |                                            |                          |                        |
|                                                                                                                                          |                                       |         |                                            |                          |                        |
| TANK INFORMATION                                                                                                                         |                                       |         |                                            | RESPONSE                 |                        |
| Is the facility open and actively dispensing fuel?                                                                                       |                                       |         |                                            | No                       |                        |
| If the facility no longer dispenses fuel what is the current use of the property?                                                        |                                       |         |                                            | Vacant                   |                        |
| Number of tanks in use (locate tanks, piping, and dispensers on site map)                                                                |                                       |         |                                            | 0                        |                        |
| Number of tanks in temporary closure (locate tanks, piping, and dispensers on site map)                                                  |                                       |         |                                            | 0                        |                        |
| Number of tanks removed (locate tanks, piping, and dispensers on site map)                                                               |                                       |         |                                            | 1                        |                        |
| Tanks closed in place (locate tanks, piping, and dispensers on site map)                                                                 |                                       |         |                                            | 0                        |                        |
| Date(s) of tank closure                                                                                                                  |                                       |         |                                            | 2/4/2021                 |                        |
| SITE LITHOLOGY AND AQUIFER PARAMETERS                                                                                                    |                                       |         |                                            | RESPONSE                 |                        |
| Predominant lithology in the unsaturated zone                                                                                            |                                       |         |                                            | Sandy Silt               |                        |
| Predominant lithology in the saturated zone                                                                                              |                                       |         |                                            | unknown                  |                        |
| Date of hydraulic conductivity test. Include and label test data in 'Model Input' tab.                                                   |                                       |         |                                            | N/A                      |                        |
| Hydraulic conductivity of the impacted aquifer in cm/sec                                                                                 |                                       |         |                                            |                          |                        |
| Estimated effective porosity in the saturated zone (%)                                                                                   |                                       |         |                                            |                          |                        |
| Hydraulic gradient ( <i>specify wells used to calculate gradient in narrative</i> )                                                      |                                       |         |                                            |                          |                        |
| Estimated groundwater flow velocity in ft/day (1 cm/sec = approximately 2,835 ft/day)                                                    |                                       |         |                                            |                          |                        |
| General flow direction during this reporting period                                                                                      |                                       |         |                                            |                          |                        |
| Historically predominant flow direction                                                                                                  |                                       |         |                                            |                          |                        |
| If LNAPL present, highest transmissivity value (Tn) calculated (ft <sup>2</sup> /day). Include and label test data in 'Model Input' tab. |                                       |         |                                            |                          |                        |
| OTHER POTENTIAL SOURCES                                                                                                                  |                                       |         |                                            | RESPONSE                 |                        |
| Are there offsite sources that may account for the contamination found? If yes, detail in the narrative.                                 |                                       |         |                                            | No                       |                        |

## Exposure Pathways and Receptors

Event ID: 13987

Reporting Period: Qtr 1

Year: 2021

| POINTS OF EXPOSURE                                                                                         |                 |                  | THREATENED  | IMPACTED                        | DISTANCE FROM SOURCE (ft)      |
|------------------------------------------------------------------------------------------------------------|-----------------|------------------|-------------|---------------------------------|--------------------------------|
| Property Boundary                                                                                          |                 |                  | no          | no                              | 200                            |
| Surficial Soils                                                                                            |                 |                  | no          | yes                             | 0                              |
| Subsurface Utilities                                                                                       |                 |                  | no          | no                              | 170                            |
| Structures                                                                                                 |                 |                  | no          | no                              | 310                            |
| Groundwater Wells                                                                                          |                 |                  | no          | no                              | unknown                        |
| Surface Water                                                                                              |                 |                  | no          | no                              | 1600                           |
| Sensitive Environments                                                                                     |                 |                  | no          | no                              | unknown                        |
| UTILITY                                                                                                    | DEPTH TO WATER  | DEPTH TO UTILITY | THREATENED  | IMPACTED                        | IDENTIFIED ON POE MAP?         |
| Gas Line                                                                                                   | UNK             | UNK              | no          | no                              | no                             |
| Water Line                                                                                                 | UNK             | UNK              | no          | no                              | no                             |
| Sanitary Sewer Line                                                                                        | UNK             | UNK              | no          | no                              | no                             |
| Storm Sewer Line                                                                                           | UNK             | UNK              | no          | no                              | no                             |
| Communication Line                                                                                         | UNK             | UNK              | no          | no                              | no                             |
| Other                                                                                                      | UNK             | UNK              | no          | no                              | no                             |
| <b>Impacted and Potentially Impacted Offsite Properties (If &gt;3, note details for them in narrative)</b> |                 |                  |             |                                 |                                |
| Property Address                                                                                           | Property Use    | Exposure Pathway |             | Status                          | Report Sent to Property Owner? |
|                                                                                                            |                 |                  |             |                                 |                                |
| Owner Name                                                                                                 | Mailing Address |                  |             | Phone                           | Email                          |
|                                                                                                            |                 |                  |             |                                 |                                |
| Property Address                                                                                           | Property Use    | Exposure Pathway |             | Status                          | Report Sent to Property Owner? |
|                                                                                                            |                 |                  |             |                                 |                                |
| Owner Name                                                                                                 | Mailing Address |                  |             | Phone                           | Email                          |
|                                                                                                            |                 |                  |             |                                 |                                |
| Property Address                                                                                           | Property Use    | Exposure Pathway |             | Status                          | Report Sent to Property Owner? |
|                                                                                                            |                 |                  |             |                                 |                                |
| Owner Name                                                                                                 | Mailing Address |                  |             | Phone                           | Email                          |
|                                                                                                            |                 |                  |             |                                 |                                |
| EXPOSURE PATHWAYS                                                                                          |                 |                  | ELIMINATED? | REASON                          |                                |
| Groundwater (Ingestion)                                                                                    |                 |                  | yes         | Soil concentrations below RBSLs |                                |
| Groundwater (Enclosed Space Vapors)                                                                        |                 |                  | yes         | Soil concentrations below RBSLs |                                |
| Surficial Soil (Ingestion, Ambient Vapors, Particulates, Dermal Contact)                                   |                 |                  | yes         | Soil concentrations below RBSLs |                                |
| Subsurface Soil (Enclosed Space Vapors)                                                                    |                 |                  | yes         | Soil concentrations below RBSLs |                                |
| Subsurface Soil (Leaching to Groundwater)                                                                  |                 |                  | yes         | Soil concentrations below RBSLs |                                |
| <b>All exposure pathways must be eliminated to request an NFA determination</b>                            |                 |                  |             |                                 |                                |

## Water Well and Surface Water Data Table

**Click on a cell in the section in which you wish the additional row. Then click "New Row"**

**Event ID: 13987**

Reporting Period: Qtr 1

Year: 2021

[illegible]

\*Information from the Colorado Division of Water Resources. AT A MINIMUM, input an identifier and the distance from the site

## Colorado Division of Water Resources Listed Uses

|              |                                   |
|--------------|-----------------------------------|
| 0 STORAGE    | A AUGMENTATION                    |
| 1 IRRIGATION | B EXPORT FROM BASIN               |
| 2 MUNICIPAL  | C CUMULATIVE ACCRETION TO RIVER   |
| 3 COMMERCIAL | D CUMULATIVE DEPLETION FROM RIVER |
| 4 INDUSTRIAL | E EVAPORATIVE                     |
| 5 RECREATION | F FEDERAL RESERVED                |
| 6 FISHERY    | G GEOTHERMAL                      |
| 7 FIRE       | H HOUSEHOLD USE ONLY              |
| 8 DOMESTIC   | K SNOW MAKING                     |
| 9 STOCK      | M MINIMUM STREAMFLOW              |
|              | N NET EFFECT ON RIVER             |
|              | P POWER GENERATION                |
|              | Q OTHER                           |
|              | R RECHARGE                        |
|              | S EXPORT FROM STATE               |
|              | T TRANSMOUNTAIN EXPORT            |
|              | W WILDLIFE                        |
|              | X ALL BENEFICIAL USES             |



### Soil Analytical Results Table

**Event ID:** 13987

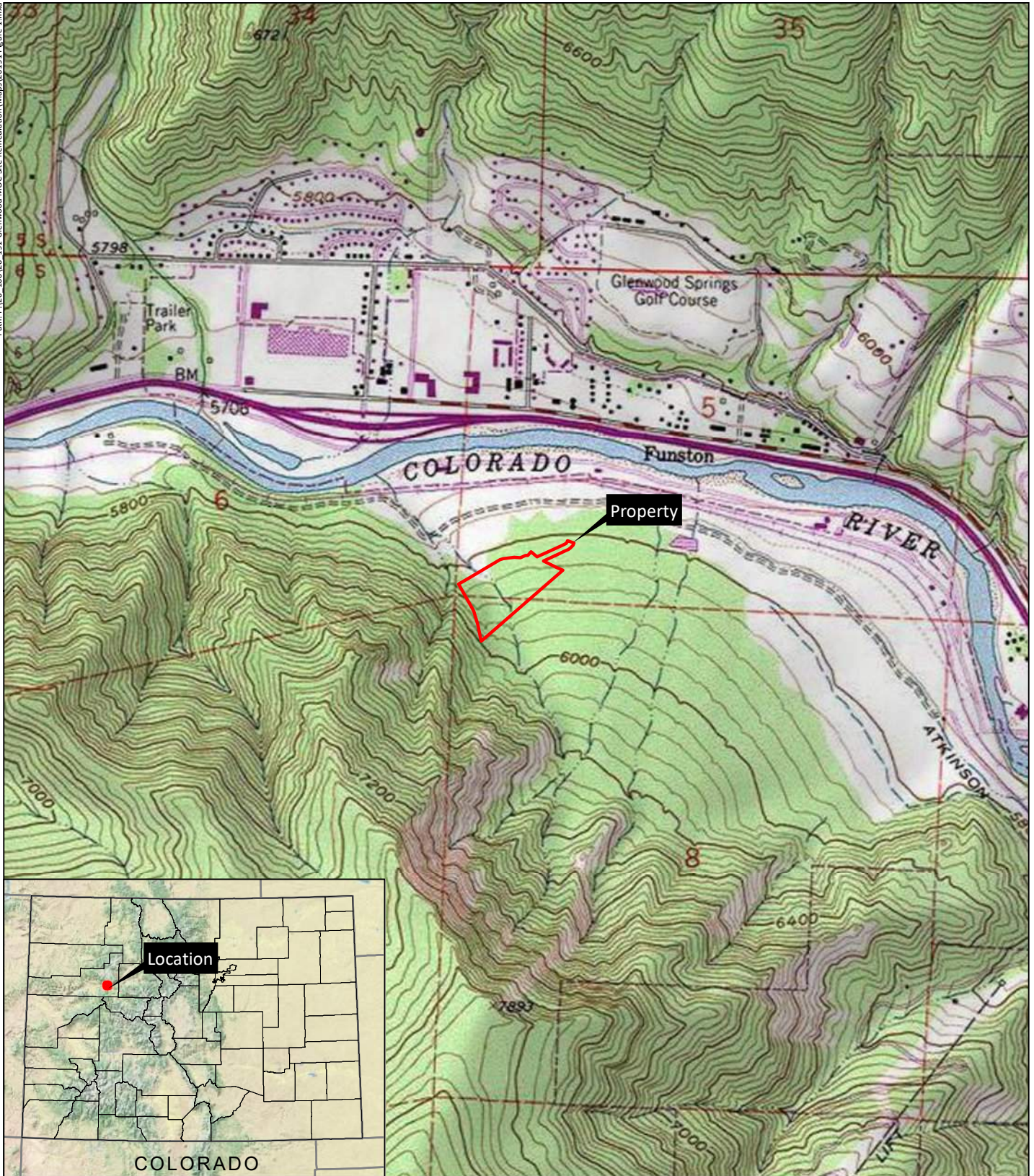
**Reporting Period: Qtr 1**

Year: 2021

**Click on a cell in the section in which you wish the additional row. Then click "New Row"**

[illegible]





# Former Municipal Operations Center, Glenwood Springs, CO

Sections 5 and 8, T6S, R89W; 6th PM

UTM NAD 83: Zone 13N; 297620mE, 4381134mN

Longitude 107.35559°W, Latitude 39.556037°N

USGS Glenwood Springs, CO Quadrangle

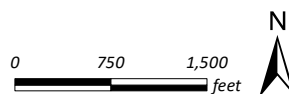
Garfield County, Colorado

Copyright: © 2013 National Geographic Society, i-cubed

## Figure 1 Vicinity Map

Prepared for: Roaring Fork Transportation Authority  
File: 20191 Figure 1.mxd [dlH]  
April 21, 2021

**ERO**  
ERO Resources Corp.







Former Glenwood Springs Municipal Operations Center, Glenwood Springs, CO

 Property

0 60 120  
feet



Figure 2  
Site Plan

Prepared for: Roaring Fork Transportation Authority  
File: 20191 Figure 2.mxd [dlH]  
July 28, 2021

**ERO**  
ERO Resources Corp.





Former Municipal Operations Center, Glenwood Springs, CO

● Soil Sample Location

Figure 3  
AST/Dispensers Soil  
Sample Location Map

Prepared for: Roaring Fork Transportation Authority  
File: 20191 Figure 3.mxd [dlH]  
April 21, 2021

**ERO**  
ERO Resources Corp.

The results set forth herein are provided by SGS North America Inc.

**e-Hardcopy 2.0**  
Automated Report

## Technical Report for

ERO Resources Corporation

RFTA MOC

20-191

SGS Job Number: DA31799

Sampling Dates: 01/12/21 - 01/13/21

### Report to:

ERO Resources Corporation  
1842 Clarkson Street  
Denver, CO 80218  
csovka@eroreources.com

ATTN: Craig Sovka

Total number of pages in report: **64**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



Jason Savoie  
General Manager

Client Service contact: Carissa Cumine 303-425-6021

Certifications: CO (CO00049), NE (NE-OS-06-04), ND (R-027), UT (NELAP CO00049)  
LA (LA150028), TX (T104704511), WY (8TMS-L)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.  
Test results relate only to samples analyzed.

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Sample Summary

ERO Resources Corporation

Job No: DA31799

RFTA MOC  
Project No: 20-191

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---------------|----------------|---------|----------|-------------|------|------------------|
|---------------|----------------|---------|----------|-------------|------|------------------|

This report contains results reported as ND = Not detected. The following applies:  
Organics ND = Not detected above the MDL

|           |          |       |    |          |    |      |                         |
|-----------|----------|-------|----|----------|----|------|-------------------------|
| DA31799-1 | 01/12/21 | 12:30 | CS | 01/13/21 | SO | Soil | HYDRAULIC LIFT          |
| DA31799-2 | 01/12/21 | 15:45 | CS | 01/13/21 | SO | Soil | NORTH END AST           |
| DA31799-3 | 01/12/21 | 15:55 | CS | 01/13/21 | SO | Soil | NORTHEAST AST           |
| DA31799-4 | 01/12/21 | 16:05 | CS | 01/13/21 | SO | Soil | SOUTHEAST AST           |
| DA31799-5 | 01/12/21 | 16:15 | CS | 01/13/21 | SO | Soil | NORTHWEST AST           |
| DA31799-6 | 01/12/21 | 16:25 | CS | 01/13/21 | SO | Soil | SOUTHWEST AST           |
| DA31799-7 | 01/13/21 | 11:00 | CS | 01/13/21 | SO | Soil | UNDER STREET SWEEPINGS  |
| DA31799-8 | 01/13/21 | 11:30 | CS | 01/13/21 | SO | Soil | NATIVE SOIL IN DRAINAGE |

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



## Summary of Hits

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERO Resources Corporation  
**Project:** RFTA MOC  
**Collected:** 01/12/21 thru 01/13/21

| Lab Sample ID<br>Analyte                 | Client Sample ID | Result/<br>Qual | RL  | MDL | Units | Method      |
|------------------------------------------|------------------|-----------------|-----|-----|-------|-------------|
| <b>DA31799-1 HYDRAULIC LIFT</b>          |                  |                 |     |     |       |             |
| Acetone <sup>a</sup>                     |                  | 89.8 B          | 55  | 24  | ug/kg | SW846 8260B |
| TPH-DRO (C10-C28)                        |                  | 10.7 J          | 11  | 10  | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40)                      |                  | 63.2            | 17  | 17  | mg/kg | SW846-8015D |
| <b>DA31799-2 NORTH END AST</b>           |                  |                 |     |     |       |             |
| TPH-DRO (C10-C28)                        |                  | 16.6            | 12  | 12  | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40)                      |                  | 53.3            | 18  | 18  | mg/kg | SW846-8015D |
| <b>DA31799-3 NORTHEAST AST</b>           |                  |                 |     |     |       |             |
| TPH-DRO (C10-C28)                        |                  | 13.7            | 11  | 11  | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40)                      |                  | 46.5            | 17  | 17  | mg/kg | SW846-8015D |
| <b>DA31799-4 SOUTHEAST AST</b>           |                  |                 |     |     |       |             |
| TPH-DRO (C10-C28)                        |                  | 46.0            | 11  | 11  | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40)                      |                  | 64.2            | 17  | 17  | mg/kg | SW846-8015D |
| <b>DA31799-5 NORTHWEST AST</b>           |                  |                 |     |     |       |             |
| TPH-DRO (C10-C28)                        |                  | 19.3            | 12  | 11  | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40)                      |                  | 57.2            | 18  | 18  | mg/kg | SW846-8015D |
| <b>DA31799-6 SOUTHWEST AST</b>           |                  |                 |     |     |       |             |
| TPH-DRO (C10-C28)                        |                  | 41.6            | 11  | 11  | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40)                      |                  | 33.0            | 17  | 17  | mg/kg | SW846-8015D |
| <b>DA31799-7 UNDER STREET SWEEPINGS</b>  |                  |                 |     |     |       |             |
| Acetone <sup>a</sup>                     |                  | 67.0 B          | 55  | 24  | ug/kg | SW846 8260B |
| TPH-ORO (> C28-C40)                      |                  | 35.1            | 17  | 17  | mg/kg | SW846-8015D |
| <b>DA31799-8 NATIVE SOIL IN DRAINAGE</b> |                  |                 |     |     |       |             |
| Acetone <sup>a</sup>                     |                  | 58.0 B          | 55  | 24  | ug/kg | SW846 8260B |
| TPH-DRO (C10-C28)                        |                  | 66.2            | 11  | 10  | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40)                      |                  | 153             | 16  | 16  | mg/kg | SW846-8015D |
| HEM Oil and Grease                       |                  | 978             | 270 |     | mg/kg | SW846 9071B |

(a) Analyte was detected in the associated method blank. Common lab contaminant.



Sample Results

Report of Analysis

## Report of Analysis

|                          |                |                        |          |
|--------------------------|----------------|------------------------|----------|
| <b>Client Sample ID:</b> | HYDRAULIC LIFT | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-1      | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil      | <b>Percent Solids:</b> | 90.7     |
| <b>Method:</b>           | SW846 8260B    |                        |          |
| <b>Project:</b>          | RFTA MOC       |                        |          |

| Run #  | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58467.D | 1  | 01/18/21 13:25 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.00 g         | 5.0 ml       |
| Run #2 |                |              |

## VOA 8260 List

| CAS No.  | Compound                    | Result | RL  | MDL  | Units | Q |
|----------|-----------------------------|--------|-----|------|-------|---|
| 67-64-1  | Acetone <sup>a</sup>        | 89.8   | 55  | 24   | ug/kg | B |
| 107-02-8 | Acrolein                    | ND     | 22  | 17   | ug/kg |   |
| 107-13-1 | Acrylonitrile               | ND     | 11  | 8.8  | ug/kg |   |
| 71-43-2  | Benzene                     | ND     | 1.1 | 0.55 | ug/kg |   |
| 108-86-1 | Bromobenzene                | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-97-5  | Bromochloromethane          | ND     | 2.2 | 0.66 | ug/kg |   |
| 75-27-4  | Bromodichloromethane        | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-25-2  | Bromoform                   | ND     | 2.2 | 1.1  | ug/kg |   |
| 104-51-8 | n-Butylbenzene              | ND     | 2.2 | 0.55 | ug/kg |   |
| 135-98-8 | sec-Butylbenzene            | ND     | 2.2 | 0.55 | ug/kg |   |
| 98-06-6  | tert-Butylbenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-15-0  | Carbon disulfide            | ND     | 2.2 | 0.55 | ug/kg |   |
| 56-23-5  | Carbon tetrachloride        | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-90-7 | Chlorobenzene               | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-00-3  | Chloroethane                | ND     | 2.2 | 0.88 | ug/kg |   |
| 110-75-8 | 2-Chloroethyl vinyl ether   | ND     | 4.4 | 1.4  | ug/kg |   |
| 67-66-3  | Chloroform                  | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-49-8  | o-Chlorotoluene             | ND     | 2.2 | 0.55 | ug/kg |   |
| 106-43-4 | p-Chlorotoluene             | ND     | 2.2 | 0.55 | ug/kg |   |
| 96-12-8  | 1,2-Dibromo-3-chloropropane | ND     | 11  | 7.7  | ug/kg |   |
| 124-48-1 | Dibromochloromethane        | ND     | 2.2 | 0.66 | ug/kg |   |
| 106-93-4 | 1,2-Dibromoethane           | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-50-1  | o-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 541-73-1 | m-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 106-46-7 | p-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-71-8  | Dichlorodifluoromethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-34-3  | 1,1-Dichloroethane          | ND     | 2.2 | 0.55 | ug/kg |   |
| 107-06-2 | 1,2-Dichloroethane          | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-35-4  | 1,1-Dichloroethylene        | ND     | 2.2 | 0.55 | ug/kg |   |
| 156-59-2 | cis-1,2-Dichloroethylene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 156-60-5 | trans-1,2-Dichloroethylene  | ND     | 2.2 | 0.55 | ug/kg |   |
| 78-87-5  | 1,2-Dichloropropane         | ND     | 2.2 | 0.55 | ug/kg |   |

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** HYDRAULIC LIFT  
**Lab Sample ID:** DA31799-1  
**Matrix:** SO - Soil  
**Method:** SW846 8260B  
**Project:** RFTA MOC

**Date Sampled:** 01/12/21  
**Date Received:** 01/13/21  
**Percent Solids:** 90.7

## VOA 8260 List

| CAS No.    | Compound                  | Result | RL  | MDL  | Units | Q |
|------------|---------------------------|--------|-----|------|-------|---|
| 142-28-9   | 1,3-Dichloropropane       | ND     | 2.2 | 0.55 | ug/kg |   |
| 594-20-7   | 2,2-Dichloropropane       | ND     | 2.2 | 0.55 | ug/kg |   |
| 563-58-6   | 1,1-Dichloropropene       | ND     | 2.2 | 0.55 | ug/kg |   |
| 10061-01-5 | cis-1,3-Dichloropropene   | ND     | 2.2 | 0.55 | ug/kg |   |
| 10061-02-6 | trans-1,3-Dichloropropene | ND     | 2.2 | 0.55 | ug/kg |   |
| 100-41-4   | Ethylbenzene              | ND     | 2.2 | 0.55 | ug/kg |   |
| 87-68-3    | Hexachlorobutadiene       | ND     | 2.2 | 0.61 | ug/kg |   |
| 591-78-6   | 2-Hexanone                | ND     | 11  | 5.5  | ug/kg |   |
| 98-82-8    | Isopropylbenzene          | ND     | 2.2 | 0.55 | ug/kg |   |
| 99-87-6    | p-Isopropyltoluene        | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-83-9    | Methyl bromide            | ND     | 2.2 | 0.55 | ug/kg |   |
| 1634-04-4  | Methyl Tert Butyl Ether   | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-87-3    | Methyl chloride           | ND     | 2.2 | 0.99 | ug/kg |   |
| 74-95-3    | Methylene bromide         | ND     | 2.2 | 0.66 | ug/kg |   |
| 75-09-2    | Methylene chloride        | ND     | 4.4 | 3.3  | ug/kg |   |
| 78-93-3    | Methyl ethyl ketone       | ND     | 11  | 5.5  | ug/kg |   |
| 108-10-1   | 4-Methyl-2-pentanone      | ND     | 11  | 5.5  | ug/kg |   |
| 91-20-3    | Naphthalene               | ND     | 4.4 | 3.3  | ug/kg |   |
| 103-65-1   | n-Propylbenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 100-42-5   | Styrene                   | ND     | 2.2 | 0.55 | ug/kg |   |
| 630-20-6   | 1,1,1,2-Tetrachloroethane | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-34-5    | 1,1,2,2-Tetrachloroethane | ND     | 2.2 | 0.55 | ug/kg |   |
| 127-18-4   | Tetrachloroethylene       | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-88-3   | Toluene                   | ND     | 2.2 | 1.1  | ug/kg |   |
| 87-61-6    | 1,2,3-Trichlorobenzene    | ND     | 2.2 | 1.1  | ug/kg |   |
| 120-82-1   | 1,2,4-Trichlorobenzene    | ND     | 2.2 | 1.1  | ug/kg |   |
| 71-55-6    | 1,1,1-Trichloroethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-00-5    | 1,1,2-Trichloroethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-01-6    | Trichloroethylene         | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-69-4    | Trichlorofluoromethane    | ND     | 2.2 | 1.1  | ug/kg |   |
| 96-18-4    | 1,2,3-Trichloropropane    | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-63-6    | 1,2,4-Trimethylbenzene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-67-8   | 1,3,5-Trimethylbenzene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-05-4   | Vinyl Acetate             | ND     | 11  | 5.5  | ug/kg |   |
| 75-01-4    | Vinyl chloride            | ND     | 2.2 | 0.55 | ug/kg |   |
| 1330-20-7  | Xylene (total)            | ND     | 2.2 | 1.1  | ug/kg |   |
|            | TPH-GRO (C6-C10)          | ND     | 220 | 110  | ug/kg |   |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

|                          |                |                        |          |
|--------------------------|----------------|------------------------|----------|
| <b>Client Sample ID:</b> | HYDRAULIC LIFT | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-1      | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil      | <b>Percent Solids:</b> | 90.7     |
| <b>Method:</b>           | SW846 8260B    |                        |          |
| <b>Project:</b>          | RFTA MOC       |                        |          |

VOA 8260 List

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 99%    |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 95%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 99%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 103%   |        | 70-130% |

(a) Analyte was detected in the associated method blank. Common lab contaminant.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
RL = Reporting Limit      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|                          |                        |                                |
|--------------------------|------------------------|--------------------------------|
| <b>Client Sample ID:</b> | HYDRAULIC LIFT         |                                |
| <b>Lab Sample ID:</b>    | DA31799-1              | <b>Date Sampled:</b> 01/12/21  |
| <b>Matrix:</b>           | SO - Soil              | <b>Date Received:</b> 01/13/21 |
| <b>Method:</b>           | SW846 8082A SW846 3546 | <b>Percent Solids:</b> 90.7    |
| <b>Project:</b>          | RFTA MOC               |                                |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | EE50871.D | 1  | 01/19/21 17:32 | GN | 01/19/21  | OP19753    | GEE2942          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 30.1 g         | 10.0 ml      |
| Run #2 |                |              |

## PCB List w 1262 &amp; 1268

| CAS No.    | Compound     | Result | RL | MDL | Units | Q |
|------------|--------------|--------|----|-----|-------|---|
| 12674-11-2 | Aroclor 1016 | ND     | 18 | 7.3 | ug/kg |   |
| 11104-28-2 | Aroclor 1221 | ND     | 18 | 7.3 | ug/kg |   |
| 11141-16-5 | Aroclor 1232 | ND     | 18 | 7.3 | ug/kg |   |
| 53469-21-9 | Aroclor 1242 | ND     | 18 | 7.3 | ug/kg |   |
| 12672-29-6 | Aroclor 1248 | ND     | 18 | 7.3 | ug/kg |   |
| 11097-69-1 | Aroclor 1254 | ND     | 18 | 7.7 | ug/kg |   |
| 11096-82-5 | Aroclor 1260 | ND     | 18 | 7.3 | ug/kg |   |
| 37324-23-5 | Aroclor 1262 | ND     | 18 | 7.3 | ug/kg |   |
| 11100-14-4 | Aroclor 1268 | ND     | 18 | 5.5 | ug/kg |   |
| 1336-36-3  | Total PCBs   | ND     | 18 | 7.7 | ug/kg |   |

| CAS No.   | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|-----------|----------------------|--------|--------|---------|
| 877-09-8  | Tetrachloro-m-xylene | 38%    |        | 10-149% |
| 877-09-8  | Tetrachloro-m-xylene | 36%    |        | 10-149% |
| 2051-24-3 | Decachlorobiphenyl   | 39%    |        | 11-162% |
| 2051-24-3 | Decachlorobiphenyl   | 39%    |        | 11-162% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

|                          |                        |  |                        |          |
|--------------------------|------------------------|--|------------------------|----------|
| <b>Client Sample ID:</b> | HYDRAULIC LIFT         |  | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-1              |  | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil              |  | <b>Percent Solids:</b> | 90.7     |
| <b>Method:</b>           | SW846-8015D SW846 3546 |  |                        |          |
| <b>Project:</b>          | RFTA MOC               |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054087.D | 1  | 01/16/21 15:57 | NO | 01/16/21  | OP19750    | GFH2153          |
| Run #2 | FM11389.D  | 1  | 01/19/21 17:10 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 10.7              | 11 | 10  | mg/kg | J |
|         | TPH-ORO (> C28-C40) | 63.2 <sup>a</sup> | 17 | 17  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 81%    | 80%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound



Report of Analysis

|                          |                |                        |          |
|--------------------------|----------------|------------------------|----------|
| <b>Client Sample ID:</b> | HYDRAULIC LIFT | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-1      | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil      | <b>Percent Solids:</b> | 90.7     |
| <b>Project:</b>          | RFTA MOC       |                        |          |

General Chemistry

| Analyte            | Result | RL  | Units | DF | Analyzed | By | Method         |
|--------------------|--------|-----|-------|----|----------|----|----------------|
| <b>%solids</b>     |        |     |       |    |          |    |                |
| Solids, Percent    | 90.7   |     | %     | 1  | 01/14/21 | ST | SM2540G-2011 M |
| HEM Oil and Grease | < 280  | 280 | mg/kg | 1  | 01/20/21 | ST | SW846 9071B    |

RL = Reporting Limit

## Report of Analysis

|                          |               |                        |          |
|--------------------------|---------------|------------------------|----------|
| <b>Client Sample ID:</b> | NORTH END AST | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-2     | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil     | <b>Percent Solids:</b> | 82.0     |
| <b>Method:</b>           | SW846 8260B   |                        |          |
| <b>Project:</b>          | RFTA MOC      |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58472.D | 1  | 01/18/21 15:21 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.08 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.2 | 0.60 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.4 | 1.2  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.4 | 0.60 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.4 | 1.2  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 240 | 120  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 99%    |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 98%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 99%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100%   |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | NORTH END AST          |                        |          |
| <b>Lab Sample ID:</b>    | DA31799-2              | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Date Received:</b>  | 01/13/21 |
| <b>Method:</b>           | SW846-8015D SW846 3546 | <b>Percent Solids:</b> | 82.0     |
| <b>Project:</b>          | RFTA MOC               |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054089.D | 1  | 01/16/21 16:18 | NO | 01/16/21  | OP19750    | GFH2153          |
| Run #2 | FM11391.D  | 1  | 01/19/21 17:48 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 16.6              | 12 | 12  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 53.3 <sup>a</sup> | 18 | 18  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 69%    | 77%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

|                          |               |                        |          |
|--------------------------|---------------|------------------------|----------|
| <b>Client Sample ID:</b> | NORTHEAST AST | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-3     | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil     | <b>Percent Solids:</b> | 89.7     |
| <b>Method:</b>           | SW846 8260B   |                        |          |
| <b>Project:</b>          | RFTA MOC      |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58473.D | 1  | 01/18/21 15:44 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.00 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.1 | 0.56 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.2 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.2 | 0.56 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.2 | 1.1  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 220 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 106%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 97%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 97%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 103%   |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | NORTHEAST AST          |                        |          |
| <b>Lab Sample ID:</b>    | DA31799-3              | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Date Received:</b>  | 01/13/21 |
| <b>Method:</b>           | SW846-8015D SW846 3546 | <b>Percent Solids:</b> | 89.7     |
| <b>Project:</b>          | RFTA MOC               |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054091.D | 1  | 01/16/21 16:40 | NO | 01/16/21  | OP19750    | GFH2153          |
| Run #2 | FM11393.D  | 1  | 01/19/21 18:27 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 13.7              | 11 | 11  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 46.5 <sup>a</sup> | 17 | 17  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 82%    | 88%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

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|                          |               |                        |          |
|--------------------------|---------------|------------------------|----------|
| <b>Client Sample ID:</b> | SOUTHEAST AST | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-4     | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil     | <b>Percent Solids:</b> | 90.1     |
| <b>Method:</b>           | SW846 8260B   |                        |          |
| <b>Project:</b>          | RFTA MOC      |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58474.D | 1  | 01/18/21 16:07 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.09 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.1 | 0.55 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.2 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.2 | 0.55 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.2 | 1.1  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 220 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 101%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 96%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 99%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100%   |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

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|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | SOUTHEAST AST          |                        |          |
| <b>Lab Sample ID:</b>    | DA31799-4              | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Date Received:</b>  | 01/13/21 |
| <b>Method:</b>           | SW846-8015D SW846 3546 | <b>Percent Solids:</b> | 90.1     |
| <b>Project:</b>          | RFTA MOC               |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054099.D | 1  | 01/16/21 18:06 | NO | 01/16/21  | OP19750    | GFH2153          |
| Run #2 | FM11399.D  | 1  | 01/19/21 20:22 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 46.0              | 11 | 11  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 64.2 <sup>a</sup> | 17 | 17  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 89%    | 87%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound



## Report of Analysis

|                          |               |                                |
|--------------------------|---------------|--------------------------------|
| <b>Client Sample ID:</b> | NORTHWEST AST |                                |
| <b>Lab Sample ID:</b>    | DA31799-5     | <b>Date Sampled:</b> 01/12/21  |
| <b>Matrix:</b>           | SO - Soil     | <b>Date Received:</b> 01/13/21 |
| <b>Method:</b>           | SW846 8260B   | <b>Percent Solids:</b> 85.6    |
| <b>Project:</b>          | RFTA MOC      |                                |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58475.D | 1  | 01/18/21 16:31 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.09 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.1 | 0.57 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.3 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.3 | 0.57 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.3 | 1.1  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 230 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 100%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 96%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 99%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 99%    |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

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|                          |                        |  |  |                        |          |
|--------------------------|------------------------|--|--|------------------------|----------|
| <b>Client Sample ID:</b> | NORTHWEST AST          |  |  | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-5              |  |  | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil              |  |  | <b>Percent Solids:</b> | 85.6     |
| <b>Method:</b>           | SW846-8015D SW846 3546 |  |  |                        |          |
| <b>Project:</b>          | RFTA MOC               |  |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054097.D | 1  | 01/16/21 17:44 | NO | 01/16/21  | OP19750    | GFH2153          |
| Run #2 | FM11401.D  | 1  | 01/19/21 21:01 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 19.3              | 12 | 11  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 57.2 <sup>a</sup> | 18 | 18  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 73%    | 69%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

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|                          |               |                        |          |
|--------------------------|---------------|------------------------|----------|
| <b>Client Sample ID:</b> | SOUTHWEST AST | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Lab Sample ID:</b>    | DA31799-6     | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil     | <b>Percent Solids:</b> | 88.3     |
| <b>Method:</b>           | SW846 8260B   |                        |          |
| <b>Project:</b>          | RFTA MOC      |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58476.D | 1  | 01/18/21 16:54 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.04 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.1 | 0.56 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.2 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.2 | 0.56 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.2 | 1.1  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 220 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 102%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 97%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 100%   |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98%    |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

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|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | SOUTHWEST AST          |                        |          |
| <b>Lab Sample ID:</b>    | DA31799-6              | <b>Date Sampled:</b>   | 01/12/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Date Received:</b>  | 01/13/21 |
| <b>Method:</b>           | SW846-8015D SW846 3546 | <b>Percent Solids:</b> | 88.3     |
| <b>Project:</b>          | RFTA MOC               |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054093.D | 1  | 01/16/21 17:01 | NO | 01/16/21  | OP19750    | GFH2153          |
| Run #2 | FM11395.D  | 1  | 01/19/21 19:05 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 41.6              | 11 | 11  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 33.0 <sup>a</sup> | 17 | 17  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 74%    | 70%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | UNDER STREET SWEEPINGS | <b>Date Sampled:</b>   | 01/13/21 |
| <b>Lab Sample ID:</b>    | DA31799-7              | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Percent Solids:</b> | 90.3     |
| <b>Method:</b>           | SW846 8260B            |                        |          |
| <b>Project:</b>          | RFTA MOC               |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58477.D | 1  | 01/18/21 17:17 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.02 g         | 5.0 ml       |
| Run #2 |                |              |

## VOA 8260 List

| CAS No.  | Compound                    | Result | RL  | MDL  | Units | Q |
|----------|-----------------------------|--------|-----|------|-------|---|
| 67-64-1  | Acetone <sup>a</sup>        | 67.0   | 55  | 24   | ug/kg | B |
| 107-02-8 | Acrolein                    | ND     | 22  | 17   | ug/kg |   |
| 107-13-1 | Acrylonitrile               | ND     | 11  | 8.8  | ug/kg |   |
| 71-43-2  | Benzene                     | ND     | 1.1 | 0.55 | ug/kg |   |
| 108-86-1 | Bromobenzene                | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-97-5  | Bromochloromethane          | ND     | 2.2 | 0.66 | ug/kg |   |
| 75-27-4  | Bromodichloromethane        | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-25-2  | Bromoform                   | ND     | 2.2 | 1.1  | ug/kg |   |
| 104-51-8 | n-Butylbenzene              | ND     | 2.2 | 0.55 | ug/kg |   |
| 135-98-8 | sec-Butylbenzene            | ND     | 2.2 | 0.55 | ug/kg |   |
| 98-06-6  | tert-Butylbenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-15-0  | Carbon disulfide            | ND     | 2.2 | 0.55 | ug/kg |   |
| 56-23-5  | Carbon tetrachloride        | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-90-7 | Chlorobenzene               | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-00-3  | Chloroethane                | ND     | 2.2 | 0.88 | ug/kg |   |
| 110-75-8 | 2-Chloroethyl vinyl ether   | ND     | 4.4 | 1.4  | ug/kg |   |
| 67-66-3  | Chloroform                  | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-49-8  | o-Chlorotoluene             | ND     | 2.2 | 0.55 | ug/kg |   |
| 106-43-4 | p-Chlorotoluene             | ND     | 2.2 | 0.55 | ug/kg |   |
| 96-12-8  | 1,2-Dibromo-3-chloropropane | ND     | 11  | 7.7  | ug/kg |   |
| 124-48-1 | Dibromochloromethane        | ND     | 2.2 | 0.66 | ug/kg |   |
| 106-93-4 | 1,2-Dibromoethane           | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-50-1  | o-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 541-73-1 | m-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 106-46-7 | p-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-71-8  | Dichlorodifluoromethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-34-3  | 1,1-Dichloroethane          | ND     | 2.2 | 0.55 | ug/kg |   |
| 107-06-2 | 1,2-Dichloroethane          | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-35-4  | 1,1-Dichloroethylene        | ND     | 2.2 | 0.55 | ug/kg |   |
| 156-59-2 | cis-1,2-Dichloroethylene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 156-60-5 | trans-1,2-Dichloroethylene  | ND     | 2.2 | 0.55 | ug/kg |   |
| 78-87-5  | 1,2-Dichloropropane         | ND     | 2.2 | 0.55 | ug/kg |   |

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** UNDER STREET SWEEPINGS**Lab Sample ID:** DA31799-7**Date Sampled:** 01/13/21**Matrix:** SO - Soil**Date Received:** 01/13/21**Method:** SW846 8260B**Percent Solids:** 90.3**Project:** RFTA MOC

## VOA 8260 List

| CAS No.    | Compound                  | Result | RL  | MDL  | Units | Q |
|------------|---------------------------|--------|-----|------|-------|---|
| 142-28-9   | 1,3-Dichloropropane       | ND     | 2.2 | 0.55 | ug/kg |   |
| 594-20-7   | 2,2-Dichloropropane       | ND     | 2.2 | 0.55 | ug/kg |   |
| 563-58-6   | 1,1-Dichloropropene       | ND     | 2.2 | 0.55 | ug/kg |   |
| 10061-01-5 | cis-1,3-Dichloropropene   | ND     | 2.2 | 0.55 | ug/kg |   |
| 10061-02-6 | trans-1,3-Dichloropropene | ND     | 2.2 | 0.55 | ug/kg |   |
| 100-41-4   | Ethylbenzene              | ND     | 2.2 | 0.55 | ug/kg |   |
| 87-68-3    | Hexachlorobutadiene       | ND     | 2.2 | 0.61 | ug/kg |   |
| 591-78-6   | 2-Hexanone                | ND     | 11  | 5.5  | ug/kg |   |
| 98-82-8    | Isopropylbenzene          | ND     | 2.2 | 0.55 | ug/kg |   |
| 99-87-6    | p-Isopropyltoluene        | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-83-9    | Methyl bromide            | ND     | 2.2 | 0.55 | ug/kg |   |
| 1634-04-4  | Methyl Tert Butyl Ether   | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-87-3    | Methyl chloride           | ND     | 2.2 | 0.99 | ug/kg |   |
| 74-95-3    | Methylene bromide         | ND     | 2.2 | 0.66 | ug/kg |   |
| 75-09-2    | Methylene chloride        | ND     | 4.4 | 3.3  | ug/kg |   |
| 78-93-3    | Methyl ethyl ketone       | ND     | 11  | 5.5  | ug/kg |   |
| 108-10-1   | 4-Methyl-2-pentanone      | ND     | 11  | 5.5  | ug/kg |   |
| 91-20-3    | Naphthalene               | ND     | 4.4 | 3.3  | ug/kg |   |
| 103-65-1   | n-Propylbenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 100-42-5   | Styrene                   | ND     | 2.2 | 0.55 | ug/kg |   |
| 630-20-6   | 1,1,1,2-Tetrachloroethane | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-34-5    | 1,1,2,2-Tetrachloroethane | ND     | 2.2 | 0.55 | ug/kg |   |
| 127-18-4   | Tetrachloroethylene       | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-88-3   | Toluene                   | ND     | 2.2 | 1.1  | ug/kg |   |
| 87-61-6    | 1,2,3-Trichlorobenzene    | ND     | 2.2 | 1.1  | ug/kg |   |
| 120-82-1   | 1,2,4-Trichlorobenzene    | ND     | 2.2 | 1.1  | ug/kg |   |
| 71-55-6    | 1,1,1-Trichloroethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-00-5    | 1,1,2-Trichloroethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-01-6    | Trichloroethylene         | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-69-4    | Trichlorofluoromethane    | ND     | 2.2 | 1.1  | ug/kg |   |
| 96-18-4    | 1,2,3-Trichloropropane    | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-63-6    | 1,2,4-Trimethylbenzene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-67-8   | 1,3,5-Trimethylbenzene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-05-4   | Vinyl Acetate             | ND     | 11  | 5.5  | ug/kg |   |
| 75-01-4    | Vinyl chloride            | ND     | 2.2 | 0.55 | ug/kg |   |
| 1330-20-7  | Xylene (total)            | ND     | 2.2 | 1.1  | ug/kg |   |
|            | TPH-GRO (C6-C10)          | ND     | 220 | 110  | ug/kg |   |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | UNDER STREET SWEEPINGS |                        |          |
| <b>Lab Sample ID:</b>    | DA31799-7              | <b>Date Sampled:</b>   | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Date Received:</b>  | 01/13/21 |
| <b>Method:</b>           | SW846 8260B            | <b>Percent Solids:</b> | 90.3     |
| <b>Project:</b>          | RFTA MOC               |                        |          |

## VOA 8260 List

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 102%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 96%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 100%   |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100%   |        | 70-130% |

(a) Analyte was detected in the associated method blank. Common lab contaminant.

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



## Report of Analysis

Page 1 of 1

|                          |                        |  |  |                        |          |
|--------------------------|------------------------|--|--|------------------------|----------|
| <b>Client Sample ID:</b> | UNDER STREET SWEEPINGS |  |  | <b>Date Sampled:</b>   | 01/13/21 |
| <b>Lab Sample ID:</b>    | DA31799-7              |  |  | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil              |  |  | <b>Percent Solids:</b> | 90.3     |
| <b>Method:</b>           | SW846-8015D SW846 3546 |  |  |                        |          |
| <b>Project:</b>          | RFTA MOC               |  |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054095.D | 1  | 01/16/21 17:23 | NO | 01/16/21  | OP19750    | GFH2153          |
| Run #2 | FM11397.D  | 1  | 01/19/21 19:44 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | ND                | 11 | 11  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 35.1 <sup>a</sup> | 17 | 17  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 81%    | 83%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Report of Analysis

|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | UNDER STREET SWEEPINGS | <b>Date Sampled:</b>   | 01/13/21 |
| <b>Lab Sample ID:</b>    | DA31799-7              | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Percent Solids:</b> | 90.3     |
| <b>Project:</b>          | RFTA MOC               |                        |          |

General Chemistry

| Analyte            | Result | RL  | Units | DF | Analyzed | By | Method         |
|--------------------|--------|-----|-------|----|----------|----|----------------|
| %solids            |        |     |       |    |          |    |                |
| Solids, Percent    | 90.3   |     | %     | 1  | 01/14/21 | ST | SM2540G-2011 M |
| HEM Oil and Grease | < 280  | 280 | mg/kg | 1  | 01/20/21 | ST | SW846 9071B    |

RL = Reporting Limit

## Report of Analysis

|                          |                         |                                |
|--------------------------|-------------------------|--------------------------------|
| <b>Client Sample ID:</b> | NATIVE SOIL IN DRAINAGE |                                |
| <b>Lab Sample ID:</b>    | DA31799-8               | <b>Date Sampled:</b> 01/13/21  |
| <b>Matrix:</b>           | SO - Soil               | <b>Date Received:</b> 01/13/21 |
| <b>Method:</b>           | SW846 8260B             | <b>Percent Solids:</b> 91.0    |
| <b>Project:</b>          | RFTA MOC                |                                |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58478.D | 1  | 01/18/21 17:41 | DC | n/a       | n/a        | V5V2982          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.03 g         | 5.0 ml       |
| Run #2 |                |              |

## VOA 8260 List

| CAS No.  | Compound                    | Result | RL  | MDL  | Units | Q |
|----------|-----------------------------|--------|-----|------|-------|---|
| 67-64-1  | Acetone <sup>a</sup>        | 58.0   | 55  | 24   | ug/kg | B |
| 107-02-8 | Acrolein                    | ND     | 22  | 16   | ug/kg |   |
| 107-13-1 | Acrylonitrile               | ND     | 11  | 8.7  | ug/kg |   |
| 71-43-2  | Benzene                     | ND     | 1.1 | 0.55 | ug/kg |   |
| 108-86-1 | Bromobenzene                | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-97-5  | Bromochloromethane          | ND     | 2.2 | 0.66 | ug/kg |   |
| 75-27-4  | Bromodichloromethane        | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-25-2  | Bromoform                   | ND     | 2.2 | 1.1  | ug/kg |   |
| 104-51-8 | n-Butylbenzene              | ND     | 2.2 | 0.55 | ug/kg |   |
| 135-98-8 | sec-Butylbenzene            | ND     | 2.2 | 0.55 | ug/kg |   |
| 98-06-6  | tert-Butylbenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-15-0  | Carbon disulfide            | ND     | 2.2 | 0.55 | ug/kg |   |
| 56-23-5  | Carbon tetrachloride        | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-90-7 | Chlorobenzene               | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-00-3  | Chloroethane                | ND     | 2.2 | 0.87 | ug/kg |   |
| 110-75-8 | 2-Chloroethyl vinyl ether   | ND     | 4.4 | 1.4  | ug/kg |   |
| 67-66-3  | Chloroform                  | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-49-8  | o-Chlorotoluene             | ND     | 2.2 | 0.55 | ug/kg |   |
| 106-43-4 | p-Chlorotoluene             | ND     | 2.2 | 0.55 | ug/kg |   |
| 96-12-8  | 1,2-Dibromo-3-chloropropane | ND     | 11  | 7.6  | ug/kg |   |
| 124-48-1 | Dibromochloromethane        | ND     | 2.2 | 0.66 | ug/kg |   |
| 106-93-4 | 1,2-Dibromoethane           | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-50-1  | o-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 541-73-1 | m-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 106-46-7 | p-Dichlorobenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-71-8  | Dichlorodifluoromethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-34-3  | 1,1-Dichloroethane          | ND     | 2.2 | 0.55 | ug/kg |   |
| 107-06-2 | 1,2-Dichloroethane          | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-35-4  | 1,1-Dichloroethylene        | ND     | 2.2 | 0.55 | ug/kg |   |
| 156-59-2 | cis-1,2-Dichloroethylene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 156-60-5 | trans-1,2-Dichloroethylene  | ND     | 2.2 | 0.55 | ug/kg |   |
| 78-87-5  | 1,2-Dichloropropane         | ND     | 2.2 | 0.55 | ug/kg |   |

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** NATIVE SOIL IN DRAINAGE  
**Lab Sample ID:** DA31799-8  
**Matrix:** SO - Soil  
**Method:** SW846 8260B  
**Project:** RFTA MOC

**Date Sampled:** 01/13/21  
**Date Received:** 01/13/21  
**Percent Solids:** 91.0

## VOA 8260 List

| CAS No.    | Compound                  | Result | RL  | MDL  | Units | Q |
|------------|---------------------------|--------|-----|------|-------|---|
| 142-28-9   | 1,3-Dichloropropane       | ND     | 2.2 | 0.55 | ug/kg |   |
| 594-20-7   | 2,2-Dichloropropane       | ND     | 2.2 | 0.55 | ug/kg |   |
| 563-58-6   | 1,1-Dichloropropene       | ND     | 2.2 | 0.55 | ug/kg |   |
| 10061-01-5 | cis-1,3-Dichloropropene   | ND     | 2.2 | 0.55 | ug/kg |   |
| 10061-02-6 | trans-1,3-Dichloropropene | ND     | 2.2 | 0.55 | ug/kg |   |
| 100-41-4   | Ethylbenzene              | ND     | 2.2 | 0.55 | ug/kg |   |
| 87-68-3    | Hexachlorobutadiene       | ND     | 2.2 | 0.60 | ug/kg |   |
| 591-78-6   | 2-Hexanone                | ND     | 11  | 5.5  | ug/kg |   |
| 98-82-8    | Isopropylbenzene          | ND     | 2.2 | 0.55 | ug/kg |   |
| 99-87-6    | p-Isopropyltoluene        | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-83-9    | Methyl bromide            | ND     | 2.2 | 0.55 | ug/kg |   |
| 1634-04-4  | Methyl Tert Butyl Ether   | ND     | 2.2 | 0.55 | ug/kg |   |
| 74-87-3    | Methyl chloride           | ND     | 2.2 | 0.98 | ug/kg |   |
| 74-95-3    | Methylene bromide         | ND     | 2.2 | 0.66 | ug/kg |   |
| 75-09-2    | Methylene chloride        | ND     | 4.4 | 3.3  | ug/kg |   |
| 78-93-3    | Methyl ethyl ketone       | ND     | 11  | 5.5  | ug/kg |   |
| 108-10-1   | 4-Methyl-2-pentanone      | ND     | 11  | 5.5  | ug/kg |   |
| 91-20-3    | Naphthalene               | ND     | 4.4 | 3.3  | ug/kg |   |
| 103-65-1   | n-Propylbenzene           | ND     | 2.2 | 0.55 | ug/kg |   |
| 100-42-5   | Styrene                   | ND     | 2.2 | 0.55 | ug/kg |   |
| 630-20-6   | 1,1,1,2-Tetrachloroethane | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-34-5    | 1,1,2,2-Tetrachloroethane | ND     | 2.2 | 0.55 | ug/kg |   |
| 127-18-4   | Tetrachloroethylene       | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-88-3   | Toluene                   | ND     | 2.2 | 1.1  | ug/kg |   |
| 87-61-6    | 1,2,3-Trichlorobenzene    | ND     | 2.2 | 1.1  | ug/kg |   |
| 120-82-1   | 1,2,4-Trichlorobenzene    | ND     | 2.2 | 1.1  | ug/kg |   |
| 71-55-6    | 1,1,1-Trichloroethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-00-5    | 1,1,2-Trichloroethane     | ND     | 2.2 | 0.55 | ug/kg |   |
| 79-01-6    | Trichloroethylene         | ND     | 2.2 | 0.55 | ug/kg |   |
| 75-69-4    | Trichlorofluoromethane    | ND     | 2.2 | 1.1  | ug/kg |   |
| 96-18-4    | 1,2,3-Trichloropropane    | ND     | 2.2 | 0.55 | ug/kg |   |
| 95-63-6    | 1,2,4-Trimethylbenzene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-67-8   | 1,3,5-Trimethylbenzene    | ND     | 2.2 | 0.55 | ug/kg |   |
| 108-05-4   | Vinyl Acetate             | ND     | 11  | 5.5  | ug/kg |   |
| 75-01-4    | Vinyl chloride            | ND     | 2.2 | 0.55 | ug/kg |   |
| 1330-20-7  | Xylene (total)            | ND     | 2.2 | 1.1  | ug/kg |   |
|            | TPH-GRO (C6-C10)          | ND     | 220 | 110  | ug/kg |   |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** NATIVE SOIL IN DRAINAGE  
**Lab Sample ID:** DA31799-8  
**Matrix:** SO - Soil  
**Method:** SW846 8260B  
**Project:** RFTA MOC

**Date Sampled:** 01/13/21  
**Date Received:** 01/13/21  
**Percent Solids:** 91.0

## VOA 8260 List

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 106%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 99%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 101%   |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102%   |        | 70-130% |

(a) Analyte was detected in the associated method blank. Common lab contaminant.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

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|                          |                         |  |  |  |  |                        |          |
|--------------------------|-------------------------|--|--|--|--|------------------------|----------|
| <b>Client Sample ID:</b> | NATIVE SOIL IN DRAINAGE |  |  |  |  | <b>Date Sampled:</b>   | 01/13/21 |
| <b>Lab Sample ID:</b>    | DA31799-8               |  |  |  |  | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil               |  |  |  |  | <b>Percent Solids:</b> | 91.0     |
| <b>Method:</b>           | SW846-8015D SW846 3546  |  |  |  |  |                        |          |
| <b>Project:</b>          | RFTA MOC                |  |  |  |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054128.D | 1  | 01/19/21 12:51 | NO | 01/16/21  | OP19750    | GFP2153          |
| Run #2 | FM11403.D  | 1  | 01/19/21 21:39 | NO | 01/16/21  | OP19751    | GFM346           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result           | RL | MDL | Units | Q |
|---------|---------------------|------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 66.2             | 11 | 10  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 153 <sup>a</sup> | 16 | 16  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 62%    | 62%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Report of Analysis

|                          |                         |                        |          |
|--------------------------|-------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | NATIVE SOIL IN DRAINAGE | <b>Date Sampled:</b>   | 01/13/21 |
| <b>Lab Sample ID:</b>    | DA31799-8               | <b>Date Received:</b>  | 01/13/21 |
| <b>Matrix:</b>           | SO - Soil               | <b>Percent Solids:</b> | 91.0     |
| <b>Project:</b>          | RFTA MOC                |                        |          |

General Chemistry

| Analyte            | Result | RL  | Units | DF | Analyzed | By | Method         |
|--------------------|--------|-----|-------|----|----------|----|----------------|
| %solids            |        |     |       |    |          |    |                |
| Solids, Percent    | 91     |     | %     | 1  | 01/14/21 | ST | SM2540G-2011 M |
| HEM Oil and Grease | 978    | 270 | mg/kg | 1  | 01/20/21 | ST | SW846 9071B    |

RL = Reporting Limit





## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



## CHAIN OF CUSTODY

SGS North America Inc. - Wheat Ridge  
4036 Youngfield Street, Wheat Ridge, CO 80033  
TEL: 303-425-6021 FAX: 303-425-6854  
www.sgs.com/ehsusa

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| Client / Reporting Information                                                                                                                                                                                                                                        |                                                                                                                | Project Information                                                                                                                                                   |                              | Requested Analysis (see TEST CODE sheet)                                                                                                                                                                                                                                                                                                                                                                |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        | Matrix Codes |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------|-----|-----|------|-------|----------|------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------------|---------|
| Company: <b>ERO</b>                                                                                                                                                                                                                                                   | Project Name: <b>RFTA MOC</b>                                                                                  |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        | DW - Drinking Water<br>GW - Ground Water<br>WW - Water<br>SW - Surface Water<br>SO - Soil<br>SL - Sludge<br>SED - Sediment<br>OI - Oil<br>LIQ - Other Liquid<br>AIR - Air<br>SOL - Other Solid<br>WIP - Wipe<br>FB - Field Blank<br>EB - Equipment Blank<br>RB - Rinse Blank<br>TB - Trip Blank |        |              |         |
| Street: <b>18th Clarkson St</b>                                                                                                                                                                                                                                       | Street:                                                                                                        |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| City, State: <b>Denver CO</b>                                                                                                                                                                                                                                         | City, State:                                                                                                   |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Project Contact: <b>830 1188</b>                                                                                                                                                                                                                                      | Project #: <b>20-191</b>                                                                                       |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Phone: <b>Craig Sorka</b>                                                                                                                                                                                                                                             | Client Purchase Order #:                                                                                       |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Email:                                                                                                                                                                                                                                                                | City, State ZIP:                                                                                               |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Sampler(s) Name(s): <b>Craig Sorka</b>                                                                                                                                                                                                                                | Project Manager:                                                                                               |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Collection                                                                                                                                                                                                                                                            |                                                                                                                | Number of preserved bottles                                                                                                                                           |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        | LAB USE ONLY                                                                                                                                                                                                                                                                                    |        |              |         |
| Field ID / Point of Collection                                                                                                                                                                                                                                        | Date                                                                                                           | Time                                                                                                                                                                  | Sampled by                   | Matrix                                                                                                                                                                                                                                                                                                                                                                                                  | # of bottles                               | NONE | HCl | NOH | HNH3 | H2SO4 | D1 Water | MECH | ENCORE | NA2S2O3                                                                                                                                                                                                                                                                                         | NA2SO3 |              |         |
| Hydraulic Lift                                                                                                                                                                                                                                                        | 1/13/21                                                                                                        | 1230                                                                                                                                                                  | AS                           | SO                                                                                                                                                                                                                                                                                                                                                                                                      | 3                                          | X    |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 01      |
| North End AST                                                                                                                                                                                                                                                         |                                                                                                                | 1545                                                                                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 02      |
| Northeast AST                                                                                                                                                                                                                                                         |                                                                                                                | 1555                                                                                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 03      |
| Southeast AST                                                                                                                                                                                                                                                         |                                                                                                                | 1605                                                                                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 04      |
| Northwest AST                                                                                                                                                                                                                                                         |                                                                                                                | 1615                                                                                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 05      |
| Southwest AST                                                                                                                                                                                                                                                         |                                                                                                                | 1625                                                                                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 06      |
| Under Street Sweeps                                                                                                                                                                                                                                                   | 1/13                                                                                                           | 1100                                                                                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 07      |
| Native Soil in Drainage                                                                                                                                                                                                                                               | n                                                                                                              | 1130                                                                                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 08      |
|                                                                                                                                                                                                                                                                       |                                                                                                                |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | SB      |
|                                                                                                                                                                                                                                                                       |                                                                                                                |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              | 1/13/21 |
| Turnaround Time (Business days)                                                                                                                                                                                                                                       |                                                                                                                | Data Deliverable Information                                                                                                                                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        | Comments / Special Instructions                                                                                                                                                                                                                                                                 |        |              |         |
| <input type="checkbox"/> Standard 10 Business Days<br><input checked="" type="checkbox"/> 5 Business Days RUSH<br><input type="checkbox"/> 3 Business Days RUSH<br><input type="checkbox"/> 2 Business Days RUSH<br><input type="checkbox"/> 1 Business Day EMERGENCY |                                                                                                                | Special Reporting Instructions<br><input checked="" type="checkbox"/> Report in PPB<br><input type="checkbox"/> Report in PPM<br><input type="checkbox"/> Report MDLs |                              | <input checked="" type="checkbox"/> Commercial "A" (Level 1, Results Only)<br><input type="checkbox"/> Commercial "B" (Level 2, Results + QC Summary)<br><input type="checkbox"/> COMMBN (Results/QC/Narrative)<br><input type="checkbox"/> COMMBN+ (Results/QC/Narrative (+ chromatograms))<br><input type="checkbox"/> REDT2<br><input type="checkbox"/> FULT1<br><input type="checkbox"/> EDD Format |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Emergency & Rush TIA data available via LabLink. RUSH TAT approval needed.                                                                                                                                                                                            |                                                                                                                |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Sample Custody must be documented below each time samples change possession, including courier delivery.                                                                                                                                                              |                                                                                                                |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Relinquished by Sampler:<br><b>Craig Sorka</b>                                                                                                                                                                                                                        | Date/Time:<br><b>1/13/21 1610</b>                                                                              | Received By:<br><b>1</b>                                                                                                                                              | Relinquished By:<br><b>2</b> | Date/Time:                                                                                                                                                                                                                                                                                                                                                                                              | Received By:<br><b>2</b>                   |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Relinquished by Sampler:<br><b>3</b>                                                                                                                                                                                                                                  | Date/Time:                                                                                                     | Received By:<br><b>3</b>                                                                                                                                              | Relinquished By:<br><b>4</b> | Date/Time:                                                                                                                                                                                                                                                                                                                                                                                              | Received By:<br><b>4</b>                   |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| Custody Seal #                                                                                                                                                                                                                                                        | Intact <input checked="" type="checkbox"/> Not Intact <input type="checkbox"/> Absent <input type="checkbox"/> | Preserved where applicable <input checked="" type="checkbox"/>                                                                                                        | Cooler Temp. °C: <b>2.0</b>  | Therm. ID: <b>1000</b>                                                                                                                                                                                                                                                                                                                                                                                  | On Ice <input checked="" type="checkbox"/> |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |
| <a href="http://www.sgs.com/en/terms-and-conditions">http://www.sgs.com/en/terms-and-conditions</a>                                                                                                                                                                   |                                                                                                                |                                                                                                                                                                       |                              |                                                                                                                                                                                                                                                                                                                                                                                                         |                                            |      |     |     |      |       |          |      |        |                                                                                                                                                                                                                                                                                                 |        |              |         |

DA31799: Chain of Custody

Page 1 of 2



# SGS Sample Receipt Summary

Job Number: DA31799

Client: ERO

Project: RFTA MOC

Date / Time Received: 1/13/2021 4:10:00 PM

Delivery Method:

Airbill #'s: HD

Cooler Temps (Initial/Adjusted): #1: (2/2):

## Cooler Security

Y or N

1. Custody Seals Present: ☒ ☐
2. Custody Seals Intact: ☒ ☐

3. COC Present:

Y or N

4. Smpl Dates/Time OK

## Cooler Temperature

Y or N

1. Temp criteria achieved: ☒ ☐
2. Cooler temp verification: IR Gun;
3. Cooler media: Ice (Bag)
4. No. Coolers: 1

## Quality Control Preservation

Y or N

N/A

1. Trip Blank present / cooler: ☐ ☐ ☒
2. Trip Blank listed on COC: ☐ ☐ ☒
3. Samples preserved properly: ☒ ☐
4. VOCs headspace free: ☐ ☐ ☒

Comments

## Sample Integrity - Documentation

Y or N

1. Sample labels present on bottles: ☒ ☐
2. Container labeling complete: ☒ ☐
3. Sample container label / COC agree: ☒ ☐

## Sample Integrity - Condition

Y or N

1. Sample recvd within HT: ☒ ☐
2. All containers accounted for: ☒ ☐
3. Condition of sample: Intact

## Sample Integrity - Instructions

Y or N N/A

1. Analysis requested is clear: ☒ ☐
2. Bottles received for unspecified tests: ☐ ☒
3. Sufficient volume recvd for analysis: ☒ ☐
4. Compositing instructions clear: ☐ ☐ ☒
5. Filtering instructions clear: ☐ ☐ ☒

DA31799: Chain of Custody

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## MS Volatiles

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### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 3

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-MB | 5V58463.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                    | Result | RL   | MDL  | Units | Q |
|------------|-----------------------------|--------|------|------|-------|---|
| 67-64-1    | Acetone <sup>a</sup>        | 2640   | 2500 | 1100 | ug/kg |   |
| 107-02-8   | Acrolein                    | ND     | 1000 | 750  | ug/kg |   |
| 107-13-1   | Acrylonitrile               | ND     | 500  | 400  | ug/kg |   |
| 71-43-2    | Benzene                     | ND     | 50   | 25   | ug/kg |   |
| 108-86-1   | Bromobenzene                | ND     | 100  | 25   | ug/kg |   |
| 74-97-5    | Bromochloromethane          | ND     | 100  | 30   | ug/kg |   |
| 75-27-4    | Bromodichloromethane        | ND     | 100  | 25   | ug/kg |   |
| 75-25-2    | Bromoform                   | ND     | 100  | 50   | ug/kg |   |
| 104-51-8   | n-Butylbenzene              | ND     | 100  | 25   | ug/kg |   |
| 135-98-8   | sec-Butylbenzene            | ND     | 100  | 25   | ug/kg |   |
| 98-06-6    | tert-Butylbenzene           | ND     | 100  | 25   | ug/kg |   |
| 75-15-0    | Carbon disulfide            | ND     | 100  | 25   | ug/kg |   |
| 56-23-5    | Carbon tetrachloride        | ND     | 100  | 25   | ug/kg |   |
| 108-90-7   | Chlorobenzene               | ND     | 100  | 25   | ug/kg |   |
| 75-00-3    | Chloroethane                | ND     | 100  | 40   | ug/kg |   |
| 110-75-8   | 2-Chloroethyl vinyl ether   | ND     | 200  | 65   | ug/kg |   |
| 67-66-3    | Chloroform                  | ND     | 100  | 25   | ug/kg |   |
| 95-49-8    | o-Chlorotoluene             | ND     | 100  | 25   | ug/kg |   |
| 106-43-4   | p-Chlorotoluene             | ND     | 100  | 25   | ug/kg |   |
| 96-12-8    | 1,2-Dibromo-3-chloropropane | ND     | 500  | 350  | ug/kg |   |
| 124-48-1   | Dibromochloromethane        | ND     | 100  | 30   | ug/kg |   |
| 106-93-4   | 1,2-Dibromoethane           | ND     | 100  | 25   | ug/kg |   |
| 95-50-1    | o-Dichlorobenzene           | ND     | 100  | 25   | ug/kg |   |
| 541-73-1   | m-Dichlorobenzene           | ND     | 100  | 25   | ug/kg |   |
| 106-46-7   | p-Dichlorobenzene           | ND     | 100  | 25   | ug/kg |   |
| 75-71-8    | Dichlorodifluoromethane     | ND     | 100  | 25   | ug/kg |   |
| 75-34-3    | 1,1-Dichloroethane          | ND     | 100  | 25   | ug/kg |   |
| 107-06-2   | 1,2-Dichloroethane          | ND     | 100  | 25   | ug/kg |   |
| 75-35-4    | 1,1-Dichloroethylene        | ND     | 100  | 25   | ug/kg |   |
| 156-59-2   | cis-1,2-Dichloroethylene    | ND     | 100  | 25   | ug/kg |   |
| 156-60-5   | trans-1,2-Dichloroethylene  | ND     | 100  | 25   | ug/kg |   |
| 78-87-5    | 1,2-Dichloropropane         | ND     | 100  | 25   | ug/kg |   |
| 142-28-9   | 1,3-Dichloropropane         | ND     | 100  | 25   | ug/kg |   |
| 594-20-7   | 2,2-Dichloropropane         | ND     | 100  | 25   | ug/kg |   |
| 563-58-6   | 1,1-Dichloropropene         | ND     | 100  | 25   | ug/kg |   |
| 10061-01-5 | cis-1,3-Dichloropropene     | ND     | 100  | 25   | ug/kg |   |

## Method Blank Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-MB | 5V58463.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                  | Result | RL    | MDL  | Units | Q |
|------------|---------------------------|--------|-------|------|-------|---|
| 10061-02-6 | trans-1,3-Dichloropropene | ND     | 100   | 25   | ug/kg |   |
| 100-41-4   | Ethylbenzene              | ND     | 100   | 25   | ug/kg |   |
| 87-68-3    | Hexachlorobutadiene       | ND     | 100   | 28   | ug/kg |   |
| 591-78-6   | 2-Hexanone                | ND     | 500   | 250  | ug/kg |   |
| 98-82-8    | Isopropylbenzene          | ND     | 100   | 25   | ug/kg |   |
| 99-87-6    | p-Isopropyltoluene        | ND     | 100   | 25   | ug/kg |   |
| 74-83-9    | Methyl bromide            | ND     | 100   | 25   | ug/kg |   |
| 1634-04-4  | Methyl Tert Butyl Ether   | ND     | 100   | 25   | ug/kg |   |
| 74-87-3    | Methyl chloride           | ND     | 100   | 45   | ug/kg |   |
| 74-95-3    | Methylene bromide         | ND     | 100   | 30   | ug/kg |   |
| 75-09-2    | Methylene chloride        | ND     | 200   | 150  | ug/kg |   |
| 78-93-3    | Methyl ethyl ketone       | ND     | 500   | 250  | ug/kg |   |
| 108-10-1   | 4-Methyl-2-pentanone      | ND     | 500   | 250  | ug/kg |   |
| 91-20-3    | Naphthalene               | ND     | 200   | 150  | ug/kg |   |
| 103-65-1   | n-Propylbenzene           | ND     | 100   | 25   | ug/kg |   |
| 100-42-5   | Styrene                   | ND     | 100   | 25   | ug/kg |   |
| 630-20-6   | 1,1,1,2-Tetrachloroethane | ND     | 100   | 25   | ug/kg |   |
| 79-34-5    | 1,1,2,2-Tetrachloroethane | ND     | 100   | 25   | ug/kg |   |
| 127-18-4   | Tetrachloroethylene       | ND     | 100   | 25   | ug/kg |   |
| 108-88-3   | Toluene                   | ND     | 100   | 50   | ug/kg |   |
| 87-61-6    | 1,2,3-Trichlorobenzene    | ND     | 100   | 50   | ug/kg |   |
| 120-82-1   | 1,2,4-Trichlorobenzene    | ND     | 100   | 50   | ug/kg |   |
| 71-55-6    | 1,1,1-Trichloroethane     | ND     | 100   | 25   | ug/kg |   |
| 79-00-5    | 1,1,2-Trichloroethane     | ND     | 100   | 25   | ug/kg |   |
| 79-01-6    | Trichloroethylene         | ND     | 100   | 25   | ug/kg |   |
| 75-69-4    | Trichlorofluoromethane    | ND     | 100   | 50   | ug/kg |   |
| 96-18-4    | 1,2,3-Trichloropropane    | ND     | 100   | 25   | ug/kg |   |
| 95-63-6    | 1,2,4-Trimethylbenzene    | ND     | 100   | 25   | ug/kg |   |
| 108-67-8   | 1,3,5-Trimethylbenzene    | ND     | 100   | 25   | ug/kg |   |
| 108-05-4   | Vinyl Acetate             | ND     | 500   | 250  | ug/kg |   |
| 75-01-4    | Vinyl chloride            | ND     | 100   | 25   | ug/kg |   |
| 1330-20-7  | Xylene (total)            | ND     | 100   | 50   | ug/kg |   |
|            | TPH-GRO (C6-C10)          | ND     | 10000 | 5000 | ug/kg |   |

Method Blank Summary

Job Number: DA31799  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-MB | 5V58463.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples: Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Surrogate Recoveries  | Limits      |
|------------|-----------------------|-------------|
| 1868-53-7  | Dibromofluoromethane  | 97% 70-131% |
| 2037-26-5  | Toluene-D8            | 94% 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 97% 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 99% 70-130% |

(a) Common lab contaminant.



## Method Blank Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-MB | 5V58464.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                    | Result | RL  | MDL  | Units | Q |
|------------|-----------------------------|--------|-----|------|-------|---|
| 67-64-1    | Acetone <sup>a</sup>        | 54.8   | 50  | 22   | ug/kg |   |
| 107-02-8   | Acrolein                    | ND     | 20  | 15   | ug/kg |   |
| 107-13-1   | Acrylonitrile               | ND     | 10  | 8.0  | ug/kg |   |
| 71-43-2    | Benzene                     | ND     | 1.0 | 0.50 | ug/kg |   |
| 108-86-1   | Bromobenzene                | ND     | 2.0 | 0.50 | ug/kg |   |
| 74-97-5    | Bromochloromethane          | ND     | 2.0 | 0.60 | ug/kg |   |
| 75-27-4    | Bromodichloromethane        | ND     | 2.0 | 0.50 | ug/kg |   |
| 75-25-2    | Bromoform                   | ND     | 2.0 | 1.0  | ug/kg |   |
| 104-51-8   | n-Butylbenzene              | ND     | 2.0 | 0.50 | ug/kg |   |
| 135-98-8   | sec-Butylbenzene            | ND     | 2.0 | 0.50 | ug/kg |   |
| 98-06-6    | tert-Butylbenzene           | ND     | 2.0 | 0.50 | ug/kg |   |
| 75-15-0    | Carbon disulfide            | ND     | 2.0 | 0.50 | ug/kg |   |
| 56-23-5    | Carbon tetrachloride        | ND     | 2.0 | 0.50 | ug/kg |   |
| 108-90-7   | Chlorobenzene               | ND     | 2.0 | 0.50 | ug/kg |   |
| 75-00-3    | Chloroethane                | ND     | 2.0 | 0.80 | ug/kg |   |
| 110-75-8   | 2-Chloroethyl vinyl ether   | ND     | 4.0 | 1.3  | ug/kg |   |
| 67-66-3    | Chloroform                  | ND     | 2.0 | 0.50 | ug/kg |   |
| 95-49-8    | o-Chlorotoluene             | ND     | 2.0 | 0.50 | ug/kg |   |
| 106-43-4   | p-Chlorotoluene             | ND     | 2.0 | 0.50 | ug/kg |   |
| 96-12-8    | 1,2-Dibromo-3-chloropropane | ND     | 10  | 7.0  | ug/kg |   |
| 124-48-1   | Dibromochloromethane        | ND     | 2.0 | 0.60 | ug/kg |   |
| 106-93-4   | 1,2-Dibromoethane           | ND     | 2.0 | 0.50 | ug/kg |   |
| 95-50-1    | o-Dichlorobenzene           | ND     | 2.0 | 0.50 | ug/kg |   |
| 541-73-1   | m-Dichlorobenzene           | ND     | 2.0 | 0.50 | ug/kg |   |
| 106-46-7   | p-Dichlorobenzene           | ND     | 2.0 | 0.50 | ug/kg |   |
| 75-71-8    | Dichlorodifluoromethane     | ND     | 2.0 | 0.50 | ug/kg |   |
| 75-34-3    | 1,1-Dichloroethane          | ND     | 2.0 | 0.50 | ug/kg |   |
| 107-06-2   | 1,2-Dichloroethane          | ND     | 2.0 | 0.50 | ug/kg |   |
| 75-35-4    | 1,1-Dichloroethylene        | ND     | 2.0 | 0.50 | ug/kg |   |
| 156-59-2   | cis-1,2-Dichloroethylene    | ND     | 2.0 | 0.50 | ug/kg |   |
| 156-60-5   | trans-1,2-Dichloroethylene  | ND     | 2.0 | 0.50 | ug/kg |   |
| 78-87-5    | 1,2-Dichloropropane         | ND     | 2.0 | 0.50 | ug/kg |   |
| 142-28-9   | 1,3-Dichloropropane         | ND     | 2.0 | 0.50 | ug/kg |   |
| 594-20-7   | 2,2-Dichloropropane         | ND     | 2.0 | 0.50 | ug/kg |   |
| 563-58-6   | 1,1-Dichloropropene         | ND     | 2.0 | 0.50 | ug/kg |   |
| 10061-01-5 | cis-1,3-Dichloropropene     | ND     | 2.0 | 0.50 | ug/kg |   |

## Method Blank Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-MB | 5V58464.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                  | Result | RL  | MDL  | Units | Q |
|------------|---------------------------|--------|-----|------|-------|---|
| 10061-02-6 | trans-1,3-Dichloropropene | ND     | 2.0 | 0.50 | ug/kg |   |
| 100-41-4   | Ethylbenzene              | ND     | 2.0 | 0.50 | ug/kg |   |
| 87-68-3    | Hexachlorobutadiene       | ND     | 2.0 | 0.55 | ug/kg |   |
| 591-78-6   | 2-Hexanone                | ND     | 10  | 5.0  | ug/kg |   |
| 98-82-8    | Isopropylbenzene          | ND     | 2.0 | 0.50 | ug/kg |   |
| 99-87-6    | p-Isopropyltoluene        | ND     | 2.0 | 0.50 | ug/kg |   |
| 74-83-9    | Methyl bromide            | ND     | 2.0 | 0.50 | ug/kg |   |
| 1634-04-4  | Methyl Tert Butyl Ether   | ND     | 2.0 | 0.50 | ug/kg |   |
| 74-87-3    | Methyl chloride           | ND     | 2.0 | 0.90 | ug/kg |   |
| 74-95-3    | Methylene bromide         | ND     | 2.0 | 0.60 | ug/kg |   |
| 75-09-2    | Methylene chloride        | ND     | 4.0 | 3.0  | ug/kg |   |
| 78-93-3    | Methyl ethyl ketone       | ND     | 10  | 5.0  | ug/kg |   |
| 108-10-1   | 4-Methyl-2-pentanone      | ND     | 10  | 5.0  | ug/kg |   |
| 91-20-3    | Naphthalene               | ND     | 4.0 | 3.0  | ug/kg |   |
| 103-65-1   | n-Propylbenzene           | ND     | 2.0 | 0.50 | ug/kg |   |
| 100-42-5   | Styrene                   | ND     | 2.0 | 0.50 | ug/kg |   |
| 630-20-6   | 1,1,1,2-Tetrachloroethane | ND     | 2.0 | 0.50 | ug/kg |   |
| 79-34-5    | 1,1,2,2-Tetrachloroethane | ND     | 2.0 | 0.50 | ug/kg |   |
| 127-18-4   | Tetrachloroethylene       | ND     | 2.0 | 0.50 | ug/kg |   |
| 108-88-3   | Toluene                   | ND     | 2.0 | 1.0  | ug/kg |   |
| 87-61-6    | 1,2,3-Trichlorobenzene    | ND     | 2.0 | 1.0  | ug/kg |   |
| 120-82-1   | 1,2,4-Trichlorobenzene    | ND     | 2.0 | 1.0  | ug/kg |   |
| 71-55-6    | 1,1,1-Trichloroethane     | ND     | 2.0 | 0.50 | ug/kg |   |
| 79-00-5    | 1,1,2-Trichloroethane     | ND     | 2.0 | 0.50 | ug/kg |   |
| 79-01-6    | Trichloroethylene         | ND     | 2.0 | 0.50 | ug/kg |   |
| 75-69-4    | Trichlorofluoromethane    | ND     | 2.0 | 1.0  | ug/kg |   |
| 96-18-4    | 1,2,3-Trichloropropane    | ND     | 2.0 | 0.50 | ug/kg |   |
| 95-63-6    | 1,2,4-Trimethylbenzene    | ND     | 2.0 | 0.50 | ug/kg |   |
| 108-67-8   | 1,3,5-Trimethylbenzene    | ND     | 2.0 | 0.50 | ug/kg |   |
| 108-05-4   | Vinyl Acetate             | ND     | 10  | 5.0  | ug/kg |   |
| 75-01-4    | Vinyl chloride            | ND     | 2.0 | 0.50 | ug/kg |   |
| 1330-20-7  | Xylene (total)            | ND     | 2.0 | 1.0  | ug/kg |   |
|            | TPH-GRO (C6-C10)          | ND     | 200 | 100  | ug/kg |   |

Method Blank Summary

Job Number: DA31799  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-MB | 5V58464.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples: Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Surrogate Recoveries  | Limits       |
|------------|-----------------------|--------------|
| 1868-53-7  | Dibromofluoromethane  | 95% 70-131%  |
| 2037-26-5  | Toluene-D8            | 98% 70-130%  |
| 460-00-4   | 4-Bromofluorobenzene  | 101% 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 95% 70-130%  |

(a) Common lab contaminant.

5.1.2  
5

## Blank Spike Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-BS | 5V58460.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                    | Spike<br>ug/kg | BSP<br>ug/kg | BSP<br>% | Limits |
|------------|-----------------------------|----------------|--------------|----------|--------|
| 67-64-1    | Acetone                     | 250            | 328          | 131      | 30-198 |
| 107-02-8   | Acrolein                    | 100            | 88.1         | 88       | 66-137 |
| 107-13-1   | Acrylonitrile               | 100            | 83.9         | 84       | 70-130 |
| 71-43-2    | Benzene                     | 50             | 44.3         | 89       | 68-130 |
| 108-86-1   | Bromobenzene                | 50             | 48.4         | 97       | 70-130 |
| 74-97-5    | Bromochloromethane          | 50             | 46.8         | 94       | 70-130 |
| 75-27-4    | Bromodichloromethane        | 50             | 47.3         | 95       | 70-130 |
| 75-25-2    | Bromoform                   | 50             | 50.8         | 102      | 68-130 |
| 104-51-8   | n-Butylbenzene              | 50             | 47.3         | 95       | 68-130 |
| 135-98-8   | sec-Butylbenzene            | 50             | 48.8         | 98       | 69-130 |
| 98-06-6    | tert-Butylbenzene           | 50             | 50.0         | 100      | 70-130 |
| 75-15-0    | Carbon disulfide            | 50             | 40.3         | 81       | 67-130 |
| 56-23-5    | Carbon tetrachloride        | 50             | 43.9         | 88       | 67-130 |
| 108-90-7   | Chlorobenzene               | 50             | 46.3         | 93       | 70-130 |
| 75-00-3    | Chloroethane                | 50             | 49.7         | 99       | 69-130 |
| 110-75-8   | 2-Chloroethyl vinyl ether   | 50             | 47.0         | 94       | 68-130 |
| 67-66-3    | Chloroform                  | 50             | 44.0         | 88       | 70-130 |
| 95-49-8    | o-Chlorotoluene             | 50             | 47.8         | 96       | 67-130 |
| 106-43-4   | p-Chlorotoluene             | 50             | 47.9         | 96       | 68-130 |
| 96-12-8    | 1,2-Dibromo-3-chloropropane | 50             | 46.9         | 94       | 68-130 |
| 124-48-1   | Dibromochloromethane        | 50             | 46.9         | 94       | 70-130 |
| 106-93-4   | 1,2-Dibromoethane           | 50             | 48.5         | 97       | 70-130 |
| 95-50-1    | o-Dichlorobenzene           | 50             | 45.2         | 90       | 70-130 |
| 541-73-1   | m-Dichlorobenzene           | 50             | 46.5         | 93       | 69-130 |
| 106-46-7   | p-Dichlorobenzene           | 50             | 44.7         | 89       | 69-130 |
| 75-71-8    | Dichlorodifluoromethane     | 50             | 50.2         | 100      | 33-173 |
| 75-34-3    | 1,1-Dichloroethane          | 50             | 42.5         | 85       | 70-130 |
| 107-06-2   | 1,2-Dichloroethane          | 50             | 44.9         | 90       | 70-130 |
| 75-35-4    | 1,1-Dichloroethylene        | 50             | 39.9         | 80       | 70-130 |
| 156-59-2   | cis-1,2-Dichloroethylene    | 50             | 45.0         | 90       | 70-130 |
| 156-60-5   | trans-1,2-Dichloroethylene  | 50             | 42.8         | 86       | 69-130 |
| 78-87-5    | 1,2-Dichloropropane         | 50             | 45.5         | 91       | 70-130 |
| 142-28-9   | 1,3-Dichloropropane         | 50             | 46.7         | 93       | 70-130 |
| 594-20-7   | 2,2-Dichloropropane         | 50             | 45.1         | 90       | 67-130 |
| 563-58-6   | 1,1-Dichloropropene         | 50             | 45.6         | 91       | 70-130 |
| 10061-01-5 | cis-1,3-Dichloropropene     | 50             | 48.4         | 97       | 70-130 |

\* = Outside of Control Limits.

## Blank Spike Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-BS | 5V58460.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                  | Spike<br>ug/kg | BSP<br>ug/kg | BSP<br>% | Limits |
|------------|---------------------------|----------------|--------------|----------|--------|
| 10061-02-6 | trans-1,3-Dichloropropene | 50             | 48.2         | 96       | 68-130 |
| 100-41-4   | Ethylbenzene              | 50             | 47.0         | 94       | 69-130 |
| 87-68-3    | Hexachlorobutadiene       | 50             | 43.6         | 87       | 67-130 |
| 591-78-6   | 2-Hexanone                | 250            | 233          | 93       | 58-130 |
| 98-82-8    | Isopropylbenzene          | 50             | 47.8         | 96       | 70-130 |
| 99-87-6    | p-Isopropyltoluene        | 50             | 49.2         | 98       | 70-130 |
| 74-83-9    | Methyl bromide            | 50             | 48.5         | 97       | 57-130 |
| 1634-04-4  | Methyl Tert Butyl Ether   | 50             | 44.8         | 90       | 70-130 |
| 74-87-3    | Methyl chloride           | 50             | 51.2         | 102      | 51-137 |
| 74-95-3    | Methylene bromide         | 50             | 47.7         | 95       | 70-130 |
| 75-09-2    | Methylene chloride        | 50             | 42.7         | 85       | 69-130 |
| 78-93-3    | Methyl ethyl ketone       | 250            | 237          | 95       | 61-136 |
| 108-10-1   | 4-Methyl-2-pentanone      | 250            | 246          | 98       | 69-130 |
| 91-20-3    | Naphthalene               | 50             | 50.0         | 100      | 70-130 |
| 103-65-1   | n-Propylbenzene           | 50             | 49.2         | 98       | 68-130 |
| 100-42-5   | Styrene                   | 50             | 50.4         | 101      | 70-130 |
| 630-20-6   | 1,1,1,2-Tetrachloroethane | 50             | 46.5         | 93       | 70-130 |
| 79-34-5    | 1,1,2,2-Tetrachloroethane | 50             | 50.4         | 101      | 68-130 |
| 127-18-4   | Tetrachloroethylene       | 50             | 45.5         | 91       | 68-130 |
| 108-88-3   | Toluene                   | 50             | 44.6         | 89       | 65-130 |
| 87-61-6    | 1,2,3-Trichlorobenzene    | 50             | 46.1         | 92       | 70-130 |
| 120-82-1   | 1,2,4-Trichlorobenzene    | 50             | 46.1         | 92       | 70-130 |
| 71-55-6    | 1,1,1-Trichloroethane     | 50             | 43.8         | 88       | 68-130 |
| 79-00-5    | 1,1,2-Trichloroethane     | 50             | 46.5         | 93       | 70-130 |
| 79-01-6    | Trichloroethylene         | 50             | 45.1         | 90       | 70-130 |
| 75-69-4    | Trichlorofluoromethane    | 50             | 48.0         | 96       | 70-130 |
| 96-18-4    | 1,2,3-Trichloropropane    | 50             | 49.6         | 99       | 68-130 |
| 95-63-6    | 1,2,4-Trimethylbenzene    | 50             | 46.9         | 94       | 66-130 |
| 108-67-8   | 1,3,5-Trimethylbenzene    | 50             | 48.9         | 98       | 68-130 |
| 108-05-4   | Vinyl Acetate             | 200            | 192          | 96       | 70-130 |
| 75-01-4    | Vinyl chloride            | 50             | 50.3         | 101      | 65-130 |
| 1330-20-7  | Xylene (total)            | 150            | 140          | 93       | 69-130 |

\* = Outside of Control Limits.

## Blank Spike Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-BS | 5V58460.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

**The QC reported here applies to the following samples:**

**Method:** SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 1868-53-7  | Dibromofluoromethane  | 96%  | 70-131% |
| 2037-26-5  | Toluene-D8            | 96%  | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 102% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 99%  | 70-130% |

\* = Outside of Control Limits.

## Blank Spike Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2982-BS | 5V58461.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound         | Spike<br>ug/kg | BSP<br>ug/kg | BSP<br>% | Limits |
|---------|------------------|----------------|--------------|----------|--------|
|         | TPH-GRO (C6-C10) | 2000           | 1860         | 93       | 57-136 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 1868-53-7  | Dibromofluoromethane  | 95%  | 70-131% |
| 2037-26-5  | Toluene-D8            | 98%  | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 100% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97%  | 70-130% |

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample       | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------|-----------|----|----------|----|-----------|------------|------------------|
| DA31799-1MS  | 5V58468.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1MSD | 5V58469.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1    | 5V58467.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

**The QC reported here applies to the following samples:**

**Method:** SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                    | DA31799-1<br>ug/kg | Q | Spike<br>ug/kg | MS<br>ug/kg | MS<br>% | Spike<br>ug/kg | MSD<br>ug/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|------------|-----------------------------|--------------------|---|----------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
| 67-64-1    | Acetone                     | 89.8               | B | 275            | 380         | 106     | 272            | 371          | 103      | 2   | 5-239/30          |
| 107-02-8   | Acrolein                    | ND                 |   | 110            | 73.2        | 66      | 109            | 81.1         | 74       | 10  | 5-183/30          |
| 107-13-1   | Acrylonitrile               | ND                 |   | 110            | 88.7        | 80      | 109            | 84.0         | 78       | 5   | 37-162/30         |
| 71-43-2    | Benzene                     | ND                 |   | 54.9           | 44.5        | 81      | 54.5           | 44.1         | 81       | 1   | 48-130/30         |
| 108-86-1   | Bromobenzene                | ND                 |   | 54.9           | 48.8        | 89      | 54.5           | 47.1         | 86       | 4   | 27-136/30         |
| 74-97-5    | Bromochloromethane          | ND                 |   | 54.9           | 49.3        | 90      | 54.5           | 47.1         | 86       | 5   | 58-130/30         |
| 75-27-4    | Bromodichloromethane        | ND                 |   | 54.9           | 49.8        | 91      | 54.5           | 48.2         | 88       | 3   | 47-130/30         |
| 75-25-2    | Bromoform                   | ND                 |   | 54.9           | 54.7        | 100     | 54.5           | 52.2         | 96       | 5   | 33-130/30         |
| 104-51-8   | n-Butylbenzene              | ND                 |   | 54.9           | 47.7        | 87      | 54.5           | 47.0         | 86       | 1   | 5-168/30          |
| 135-98-8   | sec-Butylbenzene            | ND                 |   | 54.9           | 48.6        | 89      | 54.5           | 47.8         | 88       | 2   | 12-149/30         |
| 98-06-6    | tert-Butylbenzene           | ND                 |   | 54.9           | 50.0        | 91      | 54.5           | 48.5         | 89       | 3   | 20-147/30         |
| 75-15-0    | Carbon disulfide            | ND                 |   | 54.9           | 43.0        | 78      | 54.5           | 44.9         | 82       | 4   | 37-143/30         |
| 56-23-5    | Carbon tetrachloride        | ND                 |   | 54.9           | 47.0        | 86      | 54.5           | 47.0         | 86       | 0   | 37-136/30         |
| 108-90-7   | Chlorobenzene               | ND                 |   | 54.9           | 46.8        | 85      | 54.5           | 46.1         | 85       | 2   | 26-130/30         |
| 75-00-3    | Chloroethane                | ND                 |   | 54.9           | 58.2        | 106     | 54.5           | 50.3         | 92       | 15  | 43-148/30         |
| 110-75-8   | 2-Chloroethyl vinyl ether   | ND                 |   | 54.9           | 50.0        | 91      | 54.5           | 42.8         | 79       | 16  | 56-134/30         |
| 67-66-3    | Chloroform                  | ND                 |   | 54.9           | 47.7        | 87      | 54.5           | 47.4         | 87       | 1   | 56-130/30         |
| 95-49-8    | o-Chlorotoluene             | ND                 |   | 54.9           | 49.2        | 90      | 54.5           | 46.9         | 86       | 5   | 5-202/30          |
| 106-43-4   | p-Chlorotoluene             | ND                 |   | 54.9           | 49.9        | 91      | 54.5           | 46.6         | 86       | 7   | 5-227/30          |
| 96-12-8    | 1,2-Dibromo-3-chloropropane | ND                 |   | 54.9           | 47.9        | 87      | 54.5           | 48.8         | 90       | 2   | 7-187/30          |
| 124-48-1   | Dibromochloromethane        | ND                 |   | 54.9           | 49.8        | 91      | 54.5           | 49.1         | 90       | 1   | 41-130/30         |
| 106-93-4   | 1,2-Dibromoethane           | ND                 |   | 54.9           | 49.1        | 89      | 54.5           | 49.2         | 90       | 0   | 51-132/30         |
| 95-50-1    | o-Dichlorobenzene           | ND                 |   | 54.9           | 46.4        | 85      | 54.5           | 44.5         | 82       | 4   | 12-139/30         |
| 541-73-1   | m-Dichlorobenzene           | ND                 |   | 54.9           | 46.0        | 84      | 54.5           | 45.5         | 84       | 1   | 13-139/30         |
| 106-46-7   | p-Dichlorobenzene           | ND                 |   | 54.9           | 44.3        | 81      | 54.5           | 43.0         | 79       | 3   | 13-136/30         |
| 75-71-8    | Dichlorodifluoromethane     | ND                 |   | 54.9           | 54.2        | 99      | 54.5           | 48.0         | 88       | 12  | 26-173/30         |
| 75-34-3    | 1,1-Dichloroethane          | ND                 |   | 54.9           | 45.7        | 83      | 54.5           | 45.0         | 83       | 2   | 58-130/30         |
| 107-06-2   | 1,2-Dichloroethane          | ND                 |   | 54.9           | 47.2        | 86      | 54.5           | 44.8         | 82       | 5   | 59-130/30         |
| 75-35-4    | 1,1-Dichloroethylene        | ND                 |   | 54.9           | 42.7        | 78      | 54.5           | 45.1         | 83       | 5   | 55-130/30         |
| 156-59-2   | cis-1,2-Dichloroethylene    | ND                 |   | 54.9           | 47.3        | 86      | 54.5           | 46.5         | 85       | 2   | 55-130/30         |
| 156-60-5   | trans-1,2-Dichloroethylene  | ND                 |   | 54.9           | 45.9        | 84      | 54.5           | 46.1         | 85       | 0   | 49-130/30         |
| 78-87-5    | 1,2-Dichloropropane         | ND                 |   | 54.9           | 46.4        | 85      | 54.5           | 45.6         | 84       | 2   | 59-130/30         |
| 142-28-9   | 1,3-Dichloropropane         | ND                 |   | 54.9           | 50.1        | 91      | 54.5           | 48.3         | 89       | 4   | 55-130/30         |
| 594-20-7   | 2,2-Dichloropropane         | ND                 |   | 54.9           | 46.0        | 84      | 54.5           | 48.6         | 89       | 5   | 43-136/30         |
| 563-58-6   | 1,1-Dichloropropene         | ND                 |   | 54.9           | 48.4        | 88      | 54.5           | 47.9         | 88       | 1   | 42-132/30         |
| 10061-01-5 | cis-1,3-Dichloropropene     | ND                 |   | 54.9           | 52.2        | 95      | 54.5           | 49.9         | 92       | 5   | 40-133/30         |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

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**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample       | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------|-----------|----|----------|----|-----------|------------|------------------|
| DA31799-1MS  | 5V58468.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1MSD | 5V58469.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1    | 5V58467.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

**The QC reported here applies to the following samples:**

**Method:** SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Compound                  | DA31799-1<br>ug/kg | Spike<br>Q ug/kg | MS<br>ug/kg | MS<br>% | Spike<br>ug/kg | MSD<br>ug/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|------------|---------------------------|--------------------|------------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
| 10061-02-6 | trans-1,3-Dichloropropene | ND                 | 54.9             | 49.3        | 90      | 54.5           | 48.1         | 88       | 2   | 40-130/30         |
| 100-41-4   | Ethylbenzene              | ND                 | 54.9             | 48.1        | 88      | 54.5           | 48.1         | 88       | 0   | 25-144/30         |
| 87-68-3    | Hexachlorobutadiene       | ND                 | 54.9             | 42.2        | 77      | 54.5           | 42.8         | 79       | 1   | 5-153/30          |
| 591-78-6   | 2-Hexanone                | ND                 | 275              | 261         | 95      | 272            | 247          | 91       | 6   | 43-149/30         |
| 98-82-8    | Isopropylbenzene          | ND                 | 54.9             | 50.3        | 92      | 54.5           | 50.0         | 92       | 1   | 21-143/30         |
| 99-87-6    | p-Isopropyltoluene        | ND                 | 54.9             | 49.2        | 90      | 54.5           | 48.2         | 88       | 2   | 12-151/30         |
| 74-83-9    | Methyl bromide            | ND                 | 54.9             | 51.7        | 94      | 54.5           | 48.0         | 88       | 7   | 5-167/30          |
| 1634-04-4  | Methyl Tert Butyl Ether   | ND                 | 54.9             | 47.6        | 87      | 54.5           | 45.3         | 83       | 5   | 66-130/30         |
| 74-87-3    | Methyl chloride           | ND                 | 54.9             | 55.2        | 101     | 54.5           | 49.6         | 91       | 11  | 34-162/30         |
| 74-95-3    | Methylene bromide         | ND                 | 54.9             | 49.0        | 89      | 54.5           | 48.3         | 89       | 1   | 55-130/30         |
| 75-09-2    | Methylene chloride        | ND                 | 54.9             | 46.0        | 84      | 54.5           | 44.3         | 81       | 4   | 58-130/30         |
| 78-93-3    | Methyl ethyl ketone       | ND                 | 275              | 265         | 97      | 272            | 241          | 88       | 9   | 41-169/30         |
| 108-10-1   | 4-Methyl-2-pentanone      | ND                 | 275              | 280         | 102     | 272            | 252          | 93       | 11  | 54-147/30         |
| 91-20-3    | Naphthalene               | ND                 | 54.9             | 48.5        | 88      | 54.5           | 48.0         | 88       | 1   | 5-164/30          |
| 103-65-1   | n-Propylbenzene           | ND                 | 54.9             | 49.8        | 91      | 54.5           | 48.4         | 89       | 3   | 21-144/30         |
| 100-42-5   | Styrene                   | ND                 | 54.9             | 52.8        | 96      | 54.5           | 50.8         | 93       | 4   | 12-159/30         |
| 630-20-6   | 1,1,1,2-Tetrachloroethane | ND                 | 54.9             | 49.1        | 89      | 54.5           | 48.1         | 88       | 2   | 38-131/30         |
| 79-34-5    | 1,1,2,2-Tetrachloroethane | ND                 | 54.9             | 51.5        | 94      | 54.5           | 46.7         | 86       | 10  | 33-149/30         |
| 127-18-4   | Tetrachloroethylene       | ND                 | 54.9             | 47.5        | 87      | 54.5           | 47.7         | 88       | 0   | 27-134/30         |
| 108-88-3   | Toluene                   | ND                 | 54.9             | 46.9        | 85      | 54.5           | 45.9         | 84       | 2   | 34-130/30         |
| 87-61-6    | 1,2,3-Trichlorobenzene    | ND                 | 54.9             | 43.7        | 80      | 54.5           | 44.6         | 82       | 2   | 5-157/30          |
| 120-82-1   | 1,2,4-Trichlorobenzene    | ND                 | 54.9             | 44.5        | 81      | 54.5           | 46.0         | 84       | 3   | 5-164/30          |
| 71-55-6    | 1,1,1-Trichloroethane     | ND                 | 54.9             | 46.4        | 85      | 54.5           | 47.4         | 87       | 2   | 45-130/30         |
| 79-00-5    | 1,1,2-Trichloroethane     | ND                 | 54.9             | 50.6        | 92      | 54.5           | 47.9         | 88       | 5   | 30-152/30         |
| 79-01-6    | Trichloroethylene         | ND                 | 54.9             | 48.7        | 89      | 54.5           | 48.0         | 88       | 1   | 31-147/30         |
| 75-69-4    | Trichlorofluoromethane    | ND                 | 54.9             | 53.7        | 98      | 54.5           | 45.9         | 84       | 16  | 55-133/30         |
| 96-18-4    | 1,2,3-Trichloropropane    | ND                 | 54.9             | 50.9        | 93      | 54.5           | 48.0         | 88       | 6   | 51-134/30         |
| 95-63-6    | 1,2,4-Trimethylbenzene    | ND                 | 54.9             | 49.4        | 90      | 54.5           | 48.0         | 88       | 3   | 5-174/30          |
| 108-67-8   | 1,3,5-Trimethylbenzene    | ND                 | 54.9             | 50.1        | 91      | 54.5           | 47.8         | 88       | 5   | 26-138/30         |
| 108-05-4   | Vinyl Acetate             | ND                 | 220              | 66.7        | 30      | 218            | 50.1         | 23       | 28  | 5-158/30          |
| 75-01-4    | Vinyl chloride            | ND                 | 54.9             | 54.0        | 98      | 54.5           | 50.2         | 92       | 7   | 55-138/30         |
| 1330-20-7  | Xylene (total)            | ND                 | 165              | 145         | 88      | 163            | 144          | 88       | 1   | 24-143/30         |

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA31799  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample       | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------|-----------|----|----------|----|-----------|------------|------------------|
| DA31799-1MS  | 5V58468.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1MSD | 5V58469.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1    | 5V58467.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples: Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No.    | Surrogate Recoveries  | MS   | MSD  | DA31799-1 | Limits  |
|------------|-----------------------|------|------|-----------|---------|
| 1868-53-7  | Dibromofluoromethane  | 101% | 100% | 99%       | 70-131% |
| 2037-26-5  | Toluene-D8            | 101% | 98%  | 95%       | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 102% | 99%  | 99%       | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101% | 100% | 103%      | 70-130% |

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA31799  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample       | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------|-----------|----|----------|----|-----------|------------|------------------|
| DA31799-1MS  | 5V58470.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1MSD | 5V58471.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |
| DA31799-1    | 5V58467.D | 1  | 01/18/21 | DC | n/a       | n/a        | V5V2982          |

The QC reported here applies to the following samples: Method: SW846 8260B

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound         | DA31799-1<br>ug/kg | Spike<br>Q ug/kg | MS<br>ug/kg | MS<br>% | Spike<br>ug/kg | MSD<br>ug/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|------------------|--------------------|------------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
|         | TPH-GRO (C6-C10) | ND                 | 2190             | 2000        | 91      | 2190           | 1800         | 82       | 11  | 5-173/30          |

| CAS No.    | Surrogate Recoveries  | MS  | MSD | DA31799-1 | Limits  |
|------------|-----------------------|-----|-----|-----------|---------|
| 1868-53-7  | Dibromofluoromethane  | 97% | 96% | 99%       | 70-131% |
| 2037-26-5  | Toluene-D8            | 97% | 96% | 95%       | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 98% | 98% | 99%       | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 99% | 98% | 103%      | 70-130% |

\* = Outside of Control Limits.



## GC/LC Semi-volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19753-MB | EE50867.D | 1  | 01/19/21 | GN | 01/19/21  | OP19753    | GEE2942          |

The QC reported here applies to the following samples:

Method: SW846 8082A

DA31799-1

| CAS No.    | Compound     | Result | RL | MDL | Units | Q |
|------------|--------------|--------|----|-----|-------|---|
| 12674-11-2 | Aroclor 1016 | ND     | 17 | 6.7 | ug/kg |   |
| 11104-28-2 | Aroclor 1221 | ND     | 17 | 6.7 | ug/kg |   |
| 11141-16-5 | Aroclor 1232 | ND     | 17 | 6.7 | ug/kg |   |
| 53469-21-9 | Aroclor 1242 | ND     | 17 | 6.7 | ug/kg |   |
| 12672-29-6 | Aroclor 1248 | ND     | 17 | 6.7 | ug/kg |   |
| 11097-69-1 | Aroclor 1254 | ND     | 17 | 7.0 | ug/kg |   |
| 11096-82-5 | Aroclor 1260 | ND     | 17 | 6.7 | ug/kg |   |
| 37324-23-5 | Aroclor 1262 | ND     | 17 | 6.7 | ug/kg |   |
| 11100-14-4 | Aroclor 1268 | ND     | 17 | 5.0 | ug/kg |   |
| 1336-36-3  | Total PCBs   | ND     | 17 | 7.0 | ug/kg |   |

| CAS No.   | Surrogate Recoveries | Limits      |
|-----------|----------------------|-------------|
| 877-09-8  | Tetrachloro-m-xylene | 75% 10-149% |
| 877-09-8  | Tetrachloro-m-xylene | 72% 10-149% |
| 2051-24-3 | Decachlorobiphenyl   | 81% 11-162% |
| 2051-24-3 | Decachlorobiphenyl   | 81% 11-162% |

## Method Blank Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|------------|----|----------|----|-----------|------------|------------------|
| OP19750-MB | FH054086.D | 1  | 01/16/21 | NO | 01/16/21  | OP19750    | GFP2152          |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound          | Result | RL | MDL | Units | Q |
|---------|-------------------|--------|----|-----|-------|---|
|         | TPH-DRO (C10-C28) | ND     | 10 | 9.5 | mg/kg |   |

| CAS No. | Surrogate Recoveries | Limits      |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl          | 90% 25-141% |



## Method Blank Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19751-MB | FM11377.D | 1  | 01/19/21 | NO | 01/16/21  | OP19751    | GFM346           |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound            | Result | RL | MDL | Units | Q |
|---------|---------------------|--------|----|-----|-------|---|
|         | TPH-ORO (> C28-C40) | ND     | 15 | 15  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Limits      |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl          | 81% 25-141% |

## Blank Spike Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19753-BS | EE50868.D | 1  | 01/19/21 | GN | 01/19/21  | OP19753    | GEE2942          |

The QC reported here applies to the following samples:

Method: SW846 8082A

DA31799-1

| CAS No.    | Compound     | Spike<br>ug/kg | BSP<br>ug/kg | BSP<br>% | Limits |
|------------|--------------|----------------|--------------|----------|--------|
| 12674-11-2 | Aroclor 1016 | 167            | 128          | 77       | 70-133 |
| 11096-82-5 | Aroclor 1260 | 167            | 141          | 85       | 75-139 |
| 1336-36-3  | Total PCBs   | 333            | 268          | 80       | 70-139 |

| CAS No.   | Surrogate Recoveries | BSP | Limits  |
|-----------|----------------------|-----|---------|
| 877-09-8  | Tetrachloro-m-xylene | 66% | 10-149% |
| 877-09-8  | Tetrachloro-m-xylene | 63% | 10-149% |
| 2051-24-3 | Decachlorobiphenyl   | 75% | 11-162% |
| 2051-24-3 | Decachlorobiphenyl   | 75% | 11-162% |

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|------------|----|----------|----|-----------|------------|------------------|
| OP19750-BS | FH054124.D | 1  | 01/19/21 | NO | 01/16/21  | OP19750    | GFP2153          |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound          | Spike<br>mg/kg | BSP<br>mg/kg | BSP<br>% | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
|         | TPH-DRO (C10-C28) | 250            | 236          | 94       | 49-130 |

| CAS No. | Surrogate Recoveries | BSP  | Limits  |
|---------|----------------------|------|---------|
| 84-15-1 | o-Terphenyl          | 101% | 25-141% |

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19751-BS | FM11379.D | 1  | 01/19/21 | NO | 01/16/21  | OP19751    | GFM346           |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound            | Spike<br>mg/kg | BSP<br>mg/kg | BSP<br>% | Limits |
|---------|---------------------|----------------|--------------|----------|--------|
|         | TPH-ORO (> C28-C40) | 100            | 77.9         | 78       | 69-132 |

| CAS No. | Surrogate Recoveries | BSP | Limits  |
|---------|----------------------|-----|---------|
| 84-15-1 | o-Terphenyl          | 84% | 25-141% |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19753-MS  | EE50869.D | 1  | 01/19/21 | GN | 01/19/21  | OP19753    | GEE2942          |
| OP19753-MSD | EE50870.D | 1  | 01/19/21 | GN | 01/19/21  | OP19753    | GEE2942          |
| DA31799-1   | EE50871.D | 1  | 01/19/21 | GN | 01/19/21  | OP19753    | GEE2942          |

The QC reported here applies to the following samples:

Method: SW846 8082A

DA31799-1

| CAS No.    | Compound     | DA31799-1<br>ug/kg | Spike<br>Q ug/kg | MS<br>ug/kg | MS<br>% | Spike<br>ug/kg | MSD<br>ug/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|------------|--------------|--------------------|------------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
| 12674-11-2 | Aroclor 1016 | ND                 | 183              | 119         | 65      | 184            | 137          | 75       | 14  | 10-200/30         |
| 11096-82-5 | Aroclor 1260 | ND                 | 183              | 144         | 79      | 184            | 149          | 81       | 3   | 10-189/30         |
| 1336-36-3  | Total PCBs   | ND                 | 366              | 264         | 72      | 368            | 286          | 78       | 8   | 10-200/30         |

| CAS No.   | Surrogate Recoveries | MS  | MSD | DA31799-1 | Limits  |
|-----------|----------------------|-----|-----|-----------|---------|
| 877-09-8  | Tetrachloro-m-xylene | 58% | 60% | 38%       | 10-149% |
| 877-09-8  | Tetrachloro-m-xylene | 57% | 58% | 36%       | 10-149% |
| 2051-24-3 | Decachlorobiphenyl   | 70% | 73% | 39%       | 11-162% |
| 2051-24-3 | Decachlorobiphenyl   | 69% | 73% | 39%       | 11-162% |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample      | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|------------|----|----------|----|-----------|------------|------------------|
| OP19750-MS  | FH054125.D | 1  | 01/19/21 | NO | 01/16/21  | OP19750    | GFH2154          |
| OP19750-MSD | FH054127.D | 1  | 01/19/21 | NO | 01/16/21  | OP19750    | GFH2154          |
| DA31870-1   | FH054129.D | 1  | 01/19/21 | NO | 01/16/21  | OP19750    | GFH2154          |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound          | DA31870-1<br>mg/kg | Spike<br>mg/kg | MS<br>mg/kg | MS<br>% | Spike<br>mg/kg | MSD<br>mg/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|-------------------|--------------------|----------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
|         | TPH-DRO (C10-C28) | 18.9               | 294            | 252         | 79      | 294            | 253          | 80       | 0   | 10-149/30         |

| CAS No. | Surrogate Recoveries | MS  | MSD | DA31870-1 | Limits  |
|---------|----------------------|-----|-----|-----------|---------|
| 84-15-1 | o-Terphenyl          | 84% | 79% | 69%       | 25-141% |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** DA31799  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19751-MS  | FM11381.D | 1  | 01/19/21 | NO | 01/16/21  | OP19751    | GFM346           |
| OP19751-MSD | FM11383.D | 1  | 01/19/21 | NO | 01/16/21  | OP19751    | GFM346           |
| DA31823-1   | FM11385.D | 1  | 01/19/21 | NO | 01/16/21  | OP19751    | GFM346           |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8

| CAS No. | Compound            | DA31823-1<br>mg/kg | Spike<br>mg/kg | MS<br>mg/kg | MS<br>% | Spike<br>mg/kg | MSD<br>mg/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|---------------------|--------------------|----------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
|         | TPH-ORO (> C28-C40) | 313                | 108            | 397         | 78      | 108            | 424          | 103      | 7   | 10-163/30         |

| CAS No. | Surrogate Recoveries | MS  | MSD | DA31823-1 | Limits  |
|---------|----------------------|-----|-----|-----------|---------|
| 84-15-1 | o-Terphenyl          | 85% | 66% | 68%       | 25-141% |

\* = Outside of Control Limits.





## General Chemistry

### QC Data Summaries

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Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA31799  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte            | Batch ID        | RL  | MB<br>Result | Units | Spike<br>Amount | BSP<br>Result | BSP<br>%Recov | QC<br>Limits |
|--------------------|-----------------|-----|--------------|-------|-----------------|---------------|---------------|--------------|
| HEM Oil and Grease | GP28423/GN52292 | 250 | 0.00         | mg/kg | 800             | 790           | 98.8          | 70-130%      |

Associated Samples:

Batch GP28423: DA31799-1, DA31799-7, DA31799-8  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA31799  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte         | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------|----------|-----------|-------|-----------------|------------|-----|-----------|
| Solids, Percent | GN52250  | DA31784-1 | %     | 17.5            | 17.6       | 0.6 | 0-10%     |

Associated Samples:

Batch GN52250: DA31799-1, DA31799-2, DA31799-3, DA31799-4, DA31799-5, DA31799-6, DA31799-7, DA31799-8  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA31799  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte            | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|--------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| HEM Oil and Grease | GP28423/GN52292 | DA31799-1 | mg/kg | 0.00            | 882          | 849       | 96.3 | 65-130%   |

Associated Samples:

Batch GP28423: DA31799-1, DA31799-7, DA31799-8

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA31799  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte            | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MSD Result | RPD | QC Limit |
|--------------------|-----------------|-----------|-------|-----------------|--------------|------------|-----|----------|
| HEM Oil and Grease | GP28423/GN52292 | DA31799-1 | mg/kg | 0.00            | 882          | 882        | 3.8 | 30%      |

Associated Samples:

Batch GP28423: DA31799-1, DA31799-7, DA31799-8

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

7.4

7

The results set forth herein are provided by SGS North America Inc.

***e-Hardcopy 2.0***  
***Automated Report***

## Technical Report for

ERO Resources Corporation

RFTA MOC

20-191

SGS Job Number: DA32064

Sampling Date: 01/27/21

### Report to:

ERO Resources Corporation  
1842 Clarkson Street  
Denver, CO 80218  
csovka@eroreources.com

ATTN: Craig Sovka

Total number of pages in report: **58**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



Jason Savoie  
General Manager

Client Service contact: Carissa Cumine 303-425-6021

Certifications: CO (CO00049), NE (NE-OS-06-04), ND (R-027), UT (NELAP CO00049)  
LA (LA150028), TX (T104704511), WY (8TMS-L)

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Test results relate only to samples analyzed.

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Sample Summary

ERO Resources Corporation

Job No: DA32064

RFTA MOC

Project No: 20-191

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---------------|----------------|---------|----------|-------------|------|------------------|
|---------------|----------------|---------|----------|-------------|------|------------------|

This report contains results reported as ND = Not detected. The following applies:  
Organics ND = Not detected above the MDL

|           |          |       |    |          |    |      |                  |
|-----------|----------|-------|----|----------|----|------|------------------|
| DA32064-1 | 01/27/21 | 10:00 | CS | 01/27/21 | SO | Soil | WEST SEPARATOR   |
| DA32064-2 | 01/27/21 | 10:15 | CS | 01/27/21 | SO | Soil | CENTER SEPARATOR |
| DA32064-3 | 01/27/21 | 10:30 | CS | 01/27/21 | SO | Soil | EAST SEPARATOR   |
| DA32064-4 | 01/27/21 | 10:45 | CS | 01/27/21 | SO | Soil | NORTH DISPENSER  |
| DA32064-5 | 01/27/21 | 11:00 | CS | 01/27/21 | SO | Soil | SOUTH DISPENSER  |

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Summary of Hits

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERO Resources Corporation  
**Project:** RFTA MOC  
**Collected:** 01/27/21

2

| Lab Sample ID | Client Sample ID | Result/<br>Qual | RL | MDL | Units | Method |
|---------------|------------------|-----------------|----|-----|-------|--------|
|---------------|------------------|-----------------|----|-----|-------|--------|

### DA32064-1 WEST SEPARATOR

|                     |      |     |    |       |             |
|---------------------|------|-----|----|-------|-------------|
| TPH-DRO (C10-C28)   | 12.1 | 12  | 12 | mg/kg | SW846-8015D |
| TPH-ORO (> C28-C40) | 27.8 | 18  | 18 | mg/kg | SW846-8015D |
| Barium              | 165  | 1.2 |    | mg/kg | SW846 6010C |
| Chromium            | 20.1 | 1.2 |    | mg/kg | SW846 6010C |
| Lead                | 7.4  | 6.0 |    | mg/kg | SW846 6010C |

### DA32064-2 CENTER SEPARATOR

|                     |      |     |    |       |             |
|---------------------|------|-----|----|-------|-------------|
| TPH-ORO (> C28-C40) | 19.9 | 17  | 17 | mg/kg | SW846-8015D |
| Barium              | 98.9 | 1.0 |    | mg/kg | SW846 6010C |
| Chromium            | 14.2 | 1.0 |    | mg/kg | SW846 6010C |
| Lead                | 5.7  | 5.2 |    | mg/kg | SW846 6010C |

### DA32064-3 EAST SEPARATOR

|                     |      |     |    |       |             |
|---------------------|------|-----|----|-------|-------------|
| TPH-ORO (> C28-C40) | 23.2 | 17  | 17 | mg/kg | SW846-8015D |
| Barium              | 96.8 | 1.1 |    | mg/kg | SW846 6010C |
| Chromium            | 13.3 | 1.1 |    | mg/kg | SW846 6010C |

### DA32064-4 NORTH DISPENSER

No hits reported in this sample.

### DA32064-5 SOUTH DISPENSER

No hits reported in this sample.



Sample Results

Report of Analysis

## Report of Analysis

|                          |                |                        |          |
|--------------------------|----------------|------------------------|----------|
| <b>Client Sample ID:</b> | WEST SEPARATOR | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-1      | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil      | <b>Percent Solids:</b> | 81.9     |
| <b>Method:</b>           | SW846 8260B    |                        |          |
| <b>Project:</b>          | RFTA MOC       |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58554.D | 1  | 01/29/21 14:25 | DC | n/a       | n/a        | V5V2986          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.03 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.2 | 0.61 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.4 | 1.2  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.4 | 0.61 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.4 | 1.2  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 240 | 120  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 115%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 96%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 97%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 113%   |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

|                          |                        |  |  |                        |          |
|--------------------------|------------------------|--|--|------------------------|----------|
| <b>Client Sample ID:</b> | WEST SEPARATOR         |  |  | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-1              |  |  | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil              |  |  | <b>Percent Solids:</b> | 81.9     |
| <b>Method:</b>           | SW846-8015D SW846 3546 |  |  |                        |          |
| <b>Project:</b>          | RFTA MOC               |  |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054383.D | 1  | 01/30/21 19:01 | NO | 01/30/21  | OP19791    | GFH2160          |
| Run #2 | FM11439.D  | 1  | 01/30/21 19:29 | NO | 01/30/21  | OP19792    | GFM347           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | 12.1              | 12 | 12  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 27.8 <sup>a</sup> | 18 | 18  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 78%    | 79%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** WEST SEPARATOR**Lab Sample ID:** DA32064-1**Matrix:** SO - Soil**Project:** RFTA MOC**Date Sampled:** 01/27/21**Date Received:** 01/27/21**Percent Solids:** 81.9**Metals Analysis**

| Analyte  | Result | RL   | Units | DF | Prep     | Analyzed By | Method                   | Prep Method              |
|----------|--------|------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic  | < 3.0  | 3.0  | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Barium   | 165    | 1.2  | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Cadmium  | < 6.0  | 6.0  | mg/kg | 5  | 01/28/21 | 01/29/21 JD | SW846 6010C <sup>3</sup> | SW846 3050B <sup>4</sup> |
| Chromium | 20.1   | 1.2  | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Lead     | 7.4    | 6.0  | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Mercury  | < 0.10 | 0.10 | mg/kg | 1  | 01/28/21 | 01/29/21 KP | SW846 7471B <sup>2</sup> | SW846 7471B <sup>5</sup> |
| Selenium | < 6.0  | 6.0  | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Silver   | < 18   | 18   | mg/kg | 5  | 01/28/21 | 01/29/21 JD | SW846 6010C <sup>3</sup> | SW846 3050B <sup>4</sup> |

(1) Instrument QC Batch: MA13553

(2) Instrument QC Batch: MA13555

(3) Instrument QC Batch: MA13559

(4) Prep QC Batch: MP32054

(5) Prep QC Batch: MP32056

RL = Reporting Limit

Report of Analysis

|                          |                |                        |          |
|--------------------------|----------------|------------------------|----------|
| <b>Client Sample ID:</b> | WEST SEPARATOR | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-1      | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil      | <b>Percent Solids:</b> | 81.9     |
| <b>Project:</b>          | RFTA MOC       |                        |          |

General Chemistry

| Analyte            | Result | RL  | Units | DF | Analyzed | By | Method         |
|--------------------|--------|-----|-------|----|----------|----|----------------|
| %solids            |        |     |       |    |          |    |                |
| Solids, Percent    | 81.9   |     | %     | 1  | 01/28/21 | ST | SM2540G-2011 M |
| HEM Oil and Grease | < 310  | 310 | mg/kg | 1  | 02/04/21 | ST | SW846 9071B    |

RL = Reporting Limit



## Report of Analysis

|                          |                  |                                |
|--------------------------|------------------|--------------------------------|
| <b>Client Sample ID:</b> | CENTER SEPARATOR |                                |
| <b>Lab Sample ID:</b>    | DA32064-2        | <b>Date Sampled:</b> 01/27/21  |
| <b>Matrix:</b>           | SO - Soil        | <b>Date Received:</b> 01/27/21 |
| <b>Method:</b>           | SW846 8260B      | <b>Percent Solids:</b> 89.8    |
| <b>Project:</b>          | RFTA MOC         |                                |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58555.D | 1  | 01/29/21 14:49 | DC | n/a       | n/a        | V5V2986          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.09 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.1 | 0.55 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.2 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.2 | 0.55 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.2 | 1.1  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 220 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 108%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 97%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 100%   |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 97%    |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

|                          |                        |                        |          |
|--------------------------|------------------------|------------------------|----------|
| <b>Client Sample ID:</b> | CENTER SEPARATOR       |                        |          |
| <b>Lab Sample ID:</b>    | DA32064-2              | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil              | <b>Date Received:</b>  | 01/27/21 |
| <b>Method:</b>           | SW846-8015D SW846 3546 | <b>Percent Solids:</b> | 89.8     |
| <b>Project:</b>          | RFTA MOC               |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054385.D | 1  | 01/30/21 19:23 | NO | 01/30/21  | OP19791    | GFH2160          |
| Run #2 | FM11441.D  | 1  | 01/30/21 20:07 | NO | 01/30/21  | OP19792    | GFM347           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | ND                | 11 | 11  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 19.9 <sup>a</sup> | 17 | 17  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 80%    | 79%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** CENTER SEPARATOR**Lab Sample ID:** DA32064-2**Matrix:** SO - Soil**Project:** RFTA MOC**Date Sampled:** 01/27/21**Date Received:** 01/27/21**Percent Solids:** 89.8**Metals Analysis**

| Analyte  | Result  | RL    | Units | DF | Prep     | Analyzed By | Method                   | Prep Method              |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic  | < 2.6   | 2.6   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Barium   | 98.9    | 1.0   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Cadmium  | < 1.0   | 1.0   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Chromium | 14.2    | 1.0   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Lead     | 5.7     | 5.2   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Mercury  | < 0.084 | 0.084 | mg/kg | 1  | 01/28/21 | 01/29/21 KP | SW846 7471B <sup>2</sup> | SW846 7471B <sup>5</sup> |
| Selenium | < 5.2   | 5.2   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Silver   | < 15    | 15    | mg/kg | 5  | 01/28/21 | 01/29/21 JD | SW846 6010C <sup>3</sup> | SW846 3050B <sup>4</sup> |

(1) Instrument QC Batch: MA13553

(2) Instrument QC Batch: MA13555

(3) Instrument QC Batch: MA13559

(4) Prep QC Batch: MP32054

(5) Prep QC Batch: MP32056

RL = Reporting Limit

Report of Analysis

|                          |                  |                        |          |
|--------------------------|------------------|------------------------|----------|
| <b>Client Sample ID:</b> | CENTER SEPARATOR | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-2        | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil        | <b>Percent Solids:</b> | 89.8     |
| <b>Project:</b>          | RFTA MOC         |                        |          |

General Chemistry

| Analyte            | Result | RL  | Units | DF | Analyzed | By | Method         |
|--------------------|--------|-----|-------|----|----------|----|----------------|
| %solids            |        |     |       |    |          |    |                |
| Solids, Percent    | 89.8   |     | %     | 1  | 01/28/21 | ST | SM2540G-2011 M |
| HEM Oil and Grease | < 280  | 280 | mg/kg | 1  | 02/04/21 | ST | SW846 9071B    |

RL = Reporting Limit

## Report of Analysis

|                          |                |                        |          |
|--------------------------|----------------|------------------------|----------|
| <b>Client Sample ID:</b> | EAST SEPARATOR | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-3      | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil      | <b>Percent Solids:</b> | 86.5     |
| <b>Method:</b>           | SW846 8260B    |                        |          |
| <b>Project:</b>          | RFTA MOC       |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58556.D | 1  | 01/29/21 15:13 | DC | n/a       | n/a        | V5V2986          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.09 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics+ GRO

| CAS No.   | Compound         | Result | RL  | MDL  | Units | Q |
|-----------|------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene          | ND     | 1.1 | 0.57 | ug/kg |   |
| 108-88-3  | Toluene          | ND     | 2.3 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene     | ND     | 2.3 | 0.57 | ug/kg |   |
| 1330-20-7 | Xylene (total)   | ND     | 2.3 | 1.1  | ug/kg |   |
|           | TPH-GRO (C6-C10) | ND     | 230 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 108%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 97%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 99%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 99%    |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

|                          |                        |  |  |                        |          |
|--------------------------|------------------------|--|--|------------------------|----------|
| <b>Client Sample ID:</b> | EAST SEPARATOR         |  |  | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-3              |  |  | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil              |  |  | <b>Percent Solids:</b> | 86.5     |
| <b>Method:</b>           | SW846-8015D SW846 3546 |  |  |                        |          |
| <b>Project:</b>          | RFTA MOC               |  |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054387.D | 1  | 01/30/21 19:44 | NO | 01/30/21  | OP19791    | GFH2160          |
| Run #2 | FM11443.D  | 1  | 01/30/21 20:46 | NO | 01/30/21  | OP19792    | GFM347           |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 | 20.0 g         | 1.0 ml       |

| CAS No. | Compound            | Result            | RL | MDL | Units | Q |
|---------|---------------------|-------------------|----|-----|-------|---|
|         | TPH-DRO (C10-C28)   | ND                | 12 | 11  | mg/kg |   |
|         | TPH-ORO (> C28-C40) | 23.2 <sup>a</sup> | 17 | 17  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|----------------------|--------|--------|---------|
| 84-15-1 | o-Terphenyl          | 78%    | 77%    | 25-141% |

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

**Client Sample ID:** EAST SEPARATOR**Lab Sample ID:** DA32064-3**Matrix:** SO - Soil**Project:** RFTA MOC**Date Sampled:** 01/27/21**Date Received:** 01/27/21**Percent Solids:** 86.5**Metals Analysis**

| Analyte  | Result  | RL    | Units | DF | Prep     | Analyzed By | Method                   | Prep Method              |
|----------|---------|-------|-------|----|----------|-------------|--------------------------|--------------------------|
| Arsenic  | < 2.8   | 2.8   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Barium   | 96.8    | 1.1   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Cadmium  | < 1.1   | 1.1   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Chromium | 13.3    | 1.1   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Lead     | < 5.6   | 5.6   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Mercury  | < 0.096 | 0.096 | mg/kg | 1  | 01/28/21 | 01/29/21 KP | SW846 7471B <sup>2</sup> | SW846 7471B <sup>5</sup> |
| Selenium | < 5.6   | 5.6   | mg/kg | 1  | 01/28/21 | 01/28/21 JD | SW846 6010C <sup>1</sup> | SW846 3050B <sup>4</sup> |
| Silver   | < 17    | 17    | mg/kg | 5  | 01/28/21 | 01/29/21 JD | SW846 6010C <sup>3</sup> | SW846 3050B <sup>4</sup> |

(1) Instrument QC Batch: MA13553

(2) Instrument QC Batch: MA13555

(3) Instrument QC Batch: MA13559

(4) Prep QC Batch: MP32054

(5) Prep QC Batch: MP32056

RL = Reporting Limit



Report of Analysis

|                          |                |                        |          |
|--------------------------|----------------|------------------------|----------|
| <b>Client Sample ID:</b> | EAST SEPARATOR | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-3      | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil      | <b>Percent Solids:</b> | 86.5     |
| <b>Project:</b>          | RFTA MOC       |                        |          |

General Chemistry

| Analyte            | Result | RL  | Units | DF | Analyzed | By | Method         |
|--------------------|--------|-----|-------|----|----------|----|----------------|
| %solids            |        |     |       |    |          |    |                |
| Solids, Percent    | 86.5   |     | %     | 1  | 01/28/21 | ST | SM2540G-2011 M |
| HEM Oil and Grease | < 290  | 290 | mg/kg | 1  | 02/04/21 | ST | SW846 9071B    |

RL = Reporting Limit

## Report of Analysis

|                          |                 |                        |          |
|--------------------------|-----------------|------------------------|----------|
| <b>Client Sample ID:</b> | NORTH DISPENSER | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-4       | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil       | <b>Percent Solids:</b> | 91.5     |
| <b>Method:</b>           | SW846 8260B     |                        |          |
| <b>Project:</b>          | RFTA MOC        |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58557.D | 1  | 01/29/21 15:36 | DC | n/a       | n/a        | V5V2986          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.03 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics, MTBE and GRO

| CAS No.   | Compound                | Result | RL  | MDL  | Units | Q |
|-----------|-------------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene                 | ND     | 1.1 | 0.54 | ug/kg |   |
| 108-88-3  | Toluene                 | ND     | 2.2 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene            | ND     | 2.2 | 0.54 | ug/kg |   |
| 1330-20-7 | Xylene (total)          | ND     | 2.2 | 1.1  | ug/kg |   |
| 1634-04-4 | Methyl Tert Butyl Ether | ND     | 2.2 | 0.54 | ug/kg |   |
|           | TPH-GRO (C6-C10)        | ND     | 220 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 111%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 97%    |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 98%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102%   |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

|                          |                        |  |  |                        |          |
|--------------------------|------------------------|--|--|------------------------|----------|
| <b>Client Sample ID:</b> | NORTH DISPENSER        |  |  | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-4              |  |  | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil              |  |  | <b>Percent Solids:</b> | 91.5     |
| <b>Method:</b>           | SW846-8015D SW846 3546 |  |  |                        |          |
| <b>Project:</b>          | RFTA MOC               |  |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054389.D | 1  | 01/30/21 20:06 | NO | 01/30/21  | OP19791    | GFH2160          |
| Run #2 |            |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound             | Result | RL     | MDL     | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
|         | TPH-DRO (C10-C28)    | ND     | 11     | 10      | mg/kg |   |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |       |   |
| 84-15-1 | o-Terphenyl          | 84%    |        | 25-141% |       |   |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

|                          |                 |                        |          |
|--------------------------|-----------------|------------------------|----------|
| <b>Client Sample ID:</b> | SOUTH DISPENSER | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-5       | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil       | <b>Percent Solids:</b> | 93.3     |
| <b>Method:</b>           | SW846 8260B     |                        |          |
| <b>Project:</b>          | RFTA MOC        |                        |          |

|        | File ID   | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|-----------|------------|------------------|
| Run #1 | 5V58558.D | 1  | 01/29/21 16:00 | DC | n/a       | n/a        | V5V2986          |
| Run #2 |           |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 5.05 g         | 5.0 ml       |
| Run #2 |                |              |

## Purgeable Aromatics, MTBE and GRO

| CAS No.   | Compound                | Result | RL  | MDL  | Units | Q |
|-----------|-------------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene                 | ND     | 1.1 | 0.53 | ug/kg |   |
| 108-88-3  | Toluene                 | ND     | 2.1 | 1.1  | ug/kg |   |
| 100-41-4  | Ethylbenzene            | ND     | 2.1 | 0.53 | ug/kg |   |
| 1330-20-7 | Xylene (total)          | ND     | 2.1 | 1.1  | ug/kg |   |
| 1634-04-4 | Methyl Tert Butyl Ether | ND     | 2.1 | 0.53 | ug/kg |   |
|           | TPH-GRO (C6-C10)        | ND     | 210 | 110  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Run# 1 | Run# 2 | Limits  |
|------------|-----------------------|--------|--------|---------|
| 1868-53-7  | Dibromofluoromethane  | 116%   |        | 70-131% |
| 2037-26-5  | Toluene-D8            | 103%   |        | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 99%    |        | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101%   |        | 70-130% |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

|                          |                        |  |  |                        |          |
|--------------------------|------------------------|--|--|------------------------|----------|
| <b>Client Sample ID:</b> | SOUTH DISPENSER        |  |  | <b>Date Sampled:</b>   | 01/27/21 |
| <b>Lab Sample ID:</b>    | DA32064-5              |  |  | <b>Date Received:</b>  | 01/27/21 |
| <b>Matrix:</b>           | SO - Soil              |  |  | <b>Percent Solids:</b> | 93.3     |
| <b>Method:</b>           | SW846-8015D SW846 3546 |  |  |                        |          |
| <b>Project:</b>          | RFTA MOC               |  |  |                        |          |

|        | File ID    | DF | Analyzed       | By | Prep Date | Prep Batch | Analytical Batch |
|--------|------------|----|----------------|----|-----------|------------|------------------|
| Run #1 | FH054391.D | 1  | 01/30/21 20:27 | NO | 01/30/21  | OP19791    | GFH2160          |
| Run #2 |            |    |                |    |           |            |                  |

|        | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 20.0 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound             | Result | RL     | MDL     | Units | Q |
|---------|----------------------|--------|--------|---------|-------|---|
|         | TPH-DRO (C10-C28)    | ND     | 11     | 10      | mg/kg |   |
| CAS No. | Surrogate Recoveries | Run# 1 | Run# 2 | Limits  |       |   |
| 84-15-1 | o-Terphenyl          | 81%    |        | 25-141% |       |   |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound



Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



## CHAIN OF CUSTODY

SGS North America Inc. - Wheat Ridge  
4036 Youngfield Street, Wheat Ridge, CO 80033  
TEL: 303-425-6021 FAX: 303-425-6854  
www.sgs.com/ehsusa

Page 1 of 1

|                                          |                   |
|------------------------------------------|-------------------|
| Bottle Order Control #                   | FED-EX Tracking # |
| SGS Quote #                              | SGS Job # DA32064 |
| Client / Reporting Information           |                   |
| Company: ERO                             |                   |
| Street: 1842 Clarkson St                 |                   |
| City, State: Denver CO                   |                   |
| Project Contact: Craig Sorka             |                   |
| Phone: 8301188                           |                   |
| Email:                                   |                   |
| Sampler(s) Name(s): Craig Sorka          |                   |
| Project Information                      |                   |
| Project Name: RFTA MOC                   |                   |
| Street:                                  |                   |
| City, State:                             |                   |
| Company:                                 |                   |
| Project #:                               |                   |
| Client Purchase Order #:                 |                   |
| Street Address:                          |                   |
| City, State ZIP:                         |                   |
| Project Manager:                         |                   |
| Attention:                               |                   |
| Requested Analysis (see TEST CODE sheet) |                   |
| Matrix Codes                             |                   |
| LAB USE ONLY                             |                   |
| DW - Drinking Water                      |                   |
| GW - Ground Water                        |                   |
| WW - Water                               |                   |
| SW - Surface Water                       |                   |
| SO - Soil                                |                   |
| SL - Sludge                              |                   |
| SED - Sediment                           |                   |
| OI - Oil                                 |                   |
| LIQ - Other Liquid                       |                   |
| AIR - Air                                |                   |
| SOL - Other Solid                        |                   |
| WP - Wipe                                |                   |
| FB - Field Blank                         |                   |
| EB - Equipment Blank                     |                   |
| RB - Rinse Blank                         |                   |
| TB - Trip Blank                          |                   |

|                                                                                                          |  |                                                                            |  |                                                                                 |  |
|----------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------|--|---------------------------------------------------------------------------------|--|
| Turnaround Time (Business days)                                                                          |  | Data Deliverable Information                                               |  | Comments / Special Instructions                                                 |  |
| <input type="checkbox"/> Standard 10 Business Days                                                       |  | <input checked="" type="checkbox"/> Commercial "A" (Level 1, Results Only) |  |                                                                                 |  |
| <input checked="" type="checkbox"/> 5 Business Days RUSH                                                 |  | <input type="checkbox"/> Commercial "B" (Level 2, Results + QC Summary)    |  |                                                                                 |  |
| <input type="checkbox"/> 3 Business Days RUSH                                                            |  | <input type="checkbox"/> COMMBN (Results/QC/Narrative)                     |  |                                                                                 |  |
| <input type="checkbox"/> 2 Business Days RUSH                                                            |  | <input type="checkbox"/> COMMBN+ (Results/QC/Narrative (+ chromatograms))  |  |                                                                                 |  |
| <input type="checkbox"/> 1 Business Day EMERGENCY                                                        |  | <input type="checkbox"/> REDT2                                             |  |                                                                                 |  |
| Emergency & Rush T/A data available via LabLink. RUSH TAT approval needed.                               |  | <input type="checkbox"/> FULT1                                             |  | <input type="checkbox"/> EDD Format                                             |  |
| Sample Custody must be documented below each time samples change possession, including courier delivery. |  |                                                                            |  |                                                                                 |  |
| Relinquished by Sampler:                                                                                 |  | Received By:                                                               |  | Date/Time:                                                                      |  |
| 1 Craig Sorka                                                                                            |  | 2                                                                          |  | 12/21/15 15:10                                                                  |  |
| Relinquished by Sampler:                                                                                 |  | Received By:                                                               |  | Date/Time:                                                                      |  |
| 3                                                                                                        |  | 4                                                                          |  |                                                                                 |  |
| Custody Seal #                                                                                           |  | Preserved where applicable                                                 |  | Cooler Temp. °C: 4.2 Therm. ID: T400 On Ice <input checked="" type="checkbox"/> |  |

FHSR-047-0077-001FORM-Wheat Ridge - RW CAC Rev. Date: 4/10/18

DA32064: Chain of Custody

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# SGS Sample Receipt Summary

Job Number: DA32064

Client: ERO

Project: RFTA MOC

Date / Time Received: 1/27/2021 3:10:00 PM

Delivery Method:

Airbill #'s: HD

Cooler Temps (Initial/Adjusted): #1: (4.2/4.2):

## Cooler Security

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

## Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | IR Gun;                             |                          |
| 3. Cooler media:             | Ice (Bag)                           |                          |
| 4. No. Coolers:              | 1                                   |                          |

## Quality Control Preservation

Y or N N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

## Sample Integrity - Documentation

Y or N

- |                                        |                                     |                          |
|----------------------------------------|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

## Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

## Sample Integrity - Instructions

Y or N N/A

- |                                           |                                     |                                     |                                     |
|-------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume recvd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

DA32064: Chain of Custody

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## MS Volatiles

5

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2986-MB | 5V58547.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No.   | Compound                | Result | RL    | MDL  | Units | Q |
|-----------|-------------------------|--------|-------|------|-------|---|
| 71-43-2   | Benzene                 | ND     | 50    | 25   | ug/kg |   |
| 100-41-4  | Ethylbenzene            | ND     | 100   | 25   | ug/kg |   |
| 1634-04-4 | Methyl Tert Butyl Ether | ND     | 100   | 25   | ug/kg |   |
| 108-88-3  | Toluene                 | ND     | 100   | 50   | ug/kg |   |
| 1330-20-7 | Xylene (total)          | ND     | 100   | 50   | ug/kg |   |
|           | TPH-GRO (C6-C10)        | ND     | 10000 | 5000 | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Limits       |
|------------|-----------------------|--------------|
| 1868-53-7  | Dibromofluoromethane  | 106% 70-131% |
| 2037-26-5  | Toluene-D8            | 98% 70-130%  |
| 460-00-4   | 4-Bromofluorobenzene  | 96% 70-130%  |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 98% 70-130%  |

## Method Blank Summary

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2986-MB | 5V58548.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No.   | Compound                | Result | RL  | MDL  | Units | Q |
|-----------|-------------------------|--------|-----|------|-------|---|
| 71-43-2   | Benzene                 | ND     | 1.0 | 0.50 | ug/kg |   |
| 100-41-4  | Ethylbenzene            | ND     | 2.0 | 0.50 | ug/kg |   |
| 1634-04-4 | Methyl Tert Butyl Ether | ND     | 2.0 | 0.50 | ug/kg |   |
| 108-88-3  | Toluene                 | ND     | 2.0 | 1.0  | ug/kg |   |
| 1330-20-7 | Xylene (total)          | ND     | 2.0 | 1.0  | ug/kg |   |
|           | TPH-GRO (C6-C10)        | ND     | 200 | 100  | ug/kg |   |

| CAS No.    | Surrogate Recoveries  | Limits       |
|------------|-----------------------|--------------|
| 1868-53-7  | Dibromofluoromethane  | 108% 70-131% |
| 2037-26-5  | Toluene-D8            | 95% 70-130%  |
| 460-00-4   | 4-Bromofluorobenzene  | 98% 70-130%  |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 106% 70-130% |

## Blank Spike Summary

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2986-BS | 5V58544.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No.   | Compound                | Spike<br>ug/kg | BSP<br>ug/kg | BSP<br>% | Limits |
|-----------|-------------------------|----------------|--------------|----------|--------|
| 71-43-2   | Benzene                 | 50             | 47.3         | 95       | 68-130 |
| 100-41-4  | Ethylbenzene            | 50             | 49.4         | 99       | 69-130 |
| 1634-04-4 | Methyl Tert Butyl Ether | 50             | 54.1         | 108      | 70-130 |
| 108-88-3  | Toluene                 | 50             | 46.7         | 93       | 65-130 |
| 1330-20-7 | Xylene (total)          | 150            | 151          | 101      | 69-130 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 1868-53-7  | Dibromofluoromethane  | 102% | 70-131% |
| 2037-26-5  | Toluene-D8            | 100% | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 102% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 102% | 70-130% |

\* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA32064  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| V5V2986-BS | 5V58545.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |

The QC reported here applies to the following samples:

Method: SW846 8260B

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No. | Compound         | Spike<br>ug/kg | BSP<br>ug/kg | BSP<br>% | Limits |
|---------|------------------|----------------|--------------|----------|--------|
|         | TPH-GRO (C6-C10) | 2000           | 1720         | 86       | 57-136 |

| CAS No.    | Surrogate Recoveries  | BSP  | Limits  |
|------------|-----------------------|------|---------|
| 1868-53-7  | Dibromofluoromethane  | 106% | 70-131% |
| 2037-26-5  | Toluene-D8            | 96%  | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 101% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | 70-130% |

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA32064  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample       | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------|-----------|----|----------|----|-----------|------------|------------------|
| DA32100-1MS  | 5V58550.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |
| DA32100-1MSD | 5V58551.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |
| DA32100-1    | 5V58549.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |

The QC reported here applies to the following samples: Method: SW846 8260B

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No.   | Compound                | DA32100-1<br>ug/kg | Spike<br>Q ug/kg | MS<br>ug/kg | MS<br>% | Spike<br>ug/kg | MSD<br>ug/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|-----------|-------------------------|--------------------|------------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
| 71-43-2   | Benzene                 | ND                 | 53.6             | 50.5        | 94      | 52.7           | 47.0         | 89       | 7   | 48-130/30         |
| 100-41-4  | Ethylbenzene            | ND                 | 53.6             | 52.9        | 99      | 52.7           | 48.5         | 92       | 9   | 25-144/30         |
| 1634-04-4 | Methyl Tert Butyl Ether | ND                 | 53.6             | 55.4        | 103     | 52.7           | 54.6         | 104      | 1   | 66-130/30         |
| 108-88-3  | Toluene                 | ND                 | 53.6             | 50.2        | 94      | 52.7           | 47.1         | 89       | 6   | 34-130/30         |
| 1330-20-7 | Xylene (total)          | ND                 | 161              | 166         | 103     | 158            | 148          | 94       | 11  | 24-143/30         |

| CAS No.    | Surrogate Recoveries  | MS   | MSD  | DA32100-1 | Limits  |
|------------|-----------------------|------|------|-----------|---------|
| 1868-53-7  | Dibromofluoromethane  | 104% | 105% | 111%      | 70-131% |
| 2037-26-5  | Toluene-D8            | 99%  | 99%  | 96%       | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 103% | 99%  | 100%      | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 101% | 99%  | 104%      | 70-130% |

\* = Outside of Control Limits.

5.3.1  
5



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA32064  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample       | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------------|-----------|----|----------|----|-----------|------------|------------------|
| DA32100-1MS  | 5V58552.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |
| DA32100-1MSD | 5V58553.D | 1  | 01/29/21 | DC | n/a       | n/a        | V5V2986          |

The QC reported here applies to the following samples: Method: SW846 8260B

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No. | Compound         | ug/kg           | Q | Spike<br>ug/kg | MS<br>ug/kg | MS<br>% | Spike<br>ug/kg | MSD<br>ug/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|------------------|-----------------|---|----------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
|         | TPH-GRO (C6-C10) | ND <sup>a</sup> |   | 2110           | 1860        | 88      | 2140           | 1720         | 80       | 8   | 5-173/30          |

| CAS No.    | Surrogate Recoveries  | MS   | MSD  | Limits  |
|------------|-----------------------|------|------|---------|
| 1868-53-7  | Dibromofluoromethane  | 116% | 109% | 70-131% |
| 2037-26-5  | Toluene-D8            | 96%  | 95%  | 70-130% |
| 460-00-4   | 4-Bromofluorobenzene  | 102% | 100% | 70-130% |
| 17060-07-0 | 1,2-Dichloroethane-D4 | 100% | 100% | 70-130% |

(a) Result is from Run #3.

\* = Outside of Control Limits.

5.3.2  
5



## GC/LC Semi-volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|------------|----|----------|----|-----------|------------|------------------|
| OP19791-MB | FH054365.D | 1  | 01/30/21 | NO | 01/30/21  | OP19791    | GFH2160          |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No. | Compound          | Result | RL | MDL | Units | Q |
|---------|-------------------|--------|----|-----|-------|---|
|         | TPH-DRO (C10-C28) | ND     | 10 | 9.5 | mg/kg |   |

| CAS No. | Surrogate Recoveries | Limits      |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl          | 96% 25-141% |

Method Blank Summary

Job Number: DA32064  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19792-MB | FM11431.D | 1  | 01/30/21 | NO | 01/30/21  | OP19792    | GFM347           |

The QC reported here applies to the following samples: Method: SW846-8015D  
DA32064-1, DA32064-2, DA32064-3

| CAS No. | Compound            | Result | RL | MDL | Units | Q |
|---------|---------------------|--------|----|-----|-------|---|
|         | TPH-ORO (> C28-C40) | ND     | 15 | 15  | mg/kg |   |

| CAS No. | Surrogate Recoveries | Limits      |
|---------|----------------------|-------------|
| 84-15-1 | o-Terphenyl          | 81% 25-141% |

6.1.2  
6

## Blank Spike Summary

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|------------|----|----------|----|-----------|------------|------------------|
| OP19791-BS | FH054367.D | 1  | 01/30/21 | NO | 01/30/21  | OP19791    | GFH2160          |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No. | Compound          | Spike<br>mg/kg | BSP<br>mg/kg | BSP<br>% | Limits |
|---------|-------------------|----------------|--------------|----------|--------|
|         | TPH-DRO (C10-C28) | 250            | 201          | 80       | 49-130 |

| CAS No. | Surrogate Recoveries | BSP | Limits  |
|---------|----------------------|-----|---------|
| 84-15-1 | o-Terphenyl          | 87% | 25-141% |

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19792-BS | FM11433.D | 1  | 01/30/21 | NO | 01/30/21  | OP19792    | GFM347           |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA32064-1, DA32064-2, DA32064-3

| CAS No. | Compound            | Spike<br>mg/kg | BSP<br>mg/kg | BSP<br>% | Limits |
|---------|---------------------|----------------|--------------|----------|--------|
|         | TPH-ORO (> C28-C40) | 100            | 86.9         | 87       | 69-132 |

| CAS No. | Surrogate Recoveries | BSP | Limits  |
|---------|----------------------|-----|---------|
| 84-15-1 | o-Terphenyl          | 75% | 25-141% |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** DA32064  
**Account:** ERORCODN ERO Resources Corporation  
**Project:** RFTA MOC

| Sample      | File ID    | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|------------|----|----------|----|-----------|------------|------------------|
| OP19791-MS  | FH054369.D | 1  | 01/30/21 | NO | 01/30/21  | OP19791    | GFH2160          |
| OP19791-MSD | FH054371.D | 1  | 01/30/21 | NO | 01/30/21  | OP19791    | GFH2160          |
| DA32076-1   | FH054373.D | 1  | 01/30/21 | NO | 01/30/21  | OP19791    | GFH2160          |

The QC reported here applies to the following samples:

Method: SW846-8015D

DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5

| CAS No. | Compound          | DA32076-1<br>mg/kg | Spike<br>mg/kg | MS<br>mg/kg | MS<br>% | Spike<br>mg/kg | MSD<br>mg/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|-------------------|--------------------|----------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
|         | TPH-DRO (C10-C28) | 1370               | 286            | 2770        | 489* a  | 286            | 2860         | 520* a   | 3   | 10-149/30         |

| CAS No. | Surrogate Recoveries | MS  | MSD | DA32076-1 | Limits  |
|---------|----------------------|-----|-----|-----------|---------|
| 84-15-1 | o-Terphenyl          | 81% | 93% | 41%       | 25-141% |

(a) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA32064  
Account: ERORCODN ERO Resources Corporation  
Project: RFTA MOC

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| OP19792-MS  | FM11435.D | 1  | 01/30/21 | NO | 01/30/21  | OP19792    | GFM347           |
| OP19792-MSD | FM11437.D | 1  | 01/30/21 | NO | 01/30/21  | OP19792    | GFM347           |
| DA32064-1   | FM11439.D | 1  | 01/30/21 | NO | 01/30/21  | OP19792    | GFM347           |

The QC reported here applies to the following samples: Method: SW846-8015D  
DA32064-1, DA32064-2, DA32064-3

| CAS No. | Compound            | DA32064-1<br>mg/kg | Spike<br>mg/kg | MS<br>mg/kg | MS<br>% | Spike<br>mg/kg | MSD<br>mg/kg | MSD<br>% | RPD | Limits<br>Rec/RPD |
|---------|---------------------|--------------------|----------------|-------------|---------|----------------|--------------|----------|-----|-------------------|
|         | TPH-ORO (> C28-C40) | 27.8               | 122            | 110         | 67      | 122            | 121          | 76       | 10  | 10-163/30         |

| CAS No. | Surrogate Recoveries | MS  | MSD | DA32064-1 | Limits  |
|---------|----------------------|-----|-----|-----------|---------|
| 84-15-1 | o-Terphenyl          | 73% | 81% | 79%       | 25-141% |

\* = Outside of Control Limits.



## Metals Analysis

### QC Data Summaries

7

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

QC Batch ID: MP32054  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/28/21

| Metal      | RL   | IDL  | MDL | MB<br>raw | final |
|------------|------|------|-----|-----------|-------|
| Aluminum   | 10   | 1.1  | 1.7 |           |       |
| Antimony   | 3.0  | .21  | .82 |           |       |
| Arsenic    | 2.5  | .38  | 1   | 0.010     | <2.5  |
| Barium     | 1.0  | .02  | .16 | 0.10      | <1.0  |
| Beryllium  | 1.0  | .09  | .16 |           |       |
| Boron      | 5.0  | .08  | .29 |           |       |
| Cadmium    | 1.0  | .02  | .1  | -0.060    | <1.0  |
| Calcium    | 40   | .24  | 9.6 |           |       |
| Chromium   | 1.0  | .03  | .19 | 0.040     | <1.0  |
| Cobalt     | 0.50 | .05  | .12 |           |       |
| Copper     | 1.0  | .08  | .48 |           |       |
| Iron       | 7.0  | .15  | .69 |           |       |
| Lead       | 5.0  | .21  | .6  | -0.33     | <5.0  |
| Lithium    | 0.50 | .04  | .07 |           |       |
| Magnesium  | 20   | .68  | 3.9 |           |       |
| Manganese  | 0.50 | .05  | .07 |           |       |
| Molybdenum | 1.0  | .04  | .36 |           |       |
| Nickel     | 3.0  | .05  | .24 |           |       |
| Phosphorus | 10   | 1.5  | 4.3 |           |       |
| Potassium  | 200  | 9.9  | 6   |           |       |
| Selenium   | 5.0  | .71  | 1   | 0.13      | <5.0  |
| Silicon    | 5.0  | .47  | .91 |           |       |
| Silver     | 3.0  | .03  | .05 | 0.020     | <3.0  |
| Sodium     | 40   | .73  | 1.5 |           |       |
| Strontium  | 5.0  | .001 | .03 |           |       |
| Thallium   | 1.0  | .18  | .86 |           |       |
| Tin        | 5.0  | 1.2  | 1.2 |           |       |
| Titanium   | 1.0  | .01  | .27 |           |       |
| Uranium    | 5.0  | .29  | .44 |           |       |
| Vanadium   | 1.0  | .04  | .07 |           |       |
| Zinc       | 3.0  | .04  | .35 |           |       |

Associated samples MP32054: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

QC Batch ID: MP32054  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/28/21

| Metal | RL | IDL | MDL | MB<br>raw | final |
|-------|----|-----|-----|-----------|-------|
|-------|----|-----|-----|-----------|-------|

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

QC Batch ID: MP32054  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/28/21

| Metal      | DA32063-1<br>Original MS |      | SpikeLot<br>ICPALL2 | % Rec    | QC<br>Limits |
|------------|--------------------------|------|---------------------|----------|--------------|
| Aluminum   | anr                      |      |                     |          |              |
| Antimony   | anr                      |      |                     |          |              |
| Arsenic    | 2.4                      | 86.1 | 104                 | 80.7     | 75-125       |
| Barium     | 88.0                     | 274  | 207                 | 89.3     | 75-125       |
| Beryllium  | anr                      |      |                     |          |              |
| Boron      |                          |      |                     |          |              |
| Cadmium    | 0.0                      | 41.9 | 51.9                | 80.8     | 75-125       |
| Calcium    |                          |      |                     |          |              |
| Chromium   | 2.7                      | 45.6 | 51.9                | 82.7     | 75-125       |
| Cobalt     | anr                      |      |                     |          |              |
| Copper     | anr                      |      |                     |          |              |
| Iron       | anr                      |      |                     |          |              |
| Lead       | 34.0                     | 111  | 104                 | 75.3     | 75-125       |
| Lithium    |                          |      |                     |          |              |
| Magnesium  |                          |      |                     |          |              |
| Manganese  | anr                      |      |                     |          |              |
| Molybdenum |                          |      |                     |          |              |
| Nickel     | anr                      |      |                     |          |              |
| Phosphorus | anr                      |      |                     |          |              |
| Potassium  |                          |      |                     |          |              |
| Selenium   | 0.0                      | 81.2 | 104                 | 78.3     | 75-125       |
| Silicon    |                          |      |                     |          |              |
| Silver     | 0.0                      | 14.4 | 20.7                | 69.4N(a) | 75-125       |
| Sodium     |                          |      |                     |          |              |
| Strontium  |                          |      |                     |          |              |
| Thallium   | anr                      |      |                     |          |              |
| Tin        |                          |      |                     |          |              |
| Titanium   |                          |      |                     |          |              |
| Uranium    |                          |      |                     |          |              |
| Vanadium   | anr                      |      |                     |          |              |
| Zinc       | anr                      |      |                     |          |              |

Associated samples MP32054: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

QC Batch ID: MP32054  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/28/21

| Metal | DA32063-1<br>Original MS | Spike lot<br>ICPALL2 | % Rec | QC<br>Limits |
|-------|--------------------------|----------------------|-------|--------------|
|-------|--------------------------|----------------------|-------|--------------|

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

QC Batch ID: MP32054  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/28/21

| Metal      | DA32063-1<br>Original | MSD  | Spike lot<br>ICPALL2 | % Rec    | MSD<br>RPD | QC<br>Limit |
|------------|-----------------------|------|----------------------|----------|------------|-------------|
| Aluminum   | anr                   |      |                      |          |            |             |
| Antimony   | anr                   |      |                      |          |            |             |
| Arsenic    | 2.4                   | 76.5 | 102                  | 72.8N(a) | 11.8       | 20          |
| Barium     | 88.0                  | 222  | 204                  | 65.4N(a) | 21.0 (b)   | 20          |
| Beryllium  | anr                   |      |                      |          |            |             |
| Boron      |                       |      |                      |          |            |             |
| Cadmium    | 0.0                   | 36.1 | 50.9                 | 70.9N(a) | 14.9       | 20          |
| Calcium    |                       |      |                      |          |            |             |
| Chromium   | 2.7                   | 39.5 | 50.9                 | 72.3N(a) | 14.3       | 20          |
| Cobalt     | anr                   |      |                      |          |            |             |
| Copper     | anr                   |      |                      |          |            |             |
| Iron       | anr                   |      |                      |          |            |             |
| Lead       | 34.0                  | 90.1 | 102                  | 56.2N(a) | 20.8 (b)   | 20          |
| Lithium    |                       |      |                      |          |            |             |
| Magnesium  |                       |      |                      |          |            |             |
| Manganese  | anr                   |      |                      |          |            |             |
| Molybdenum |                       |      |                      |          |            |             |
| Nickel     | anr                   |      |                      |          |            |             |
| Phosphorus | anr                   |      |                      |          |            |             |
| Potassium  |                       |      |                      |          |            |             |
| Selenium   | 0.0                   | 71.9 | 102                  | 70.7N(a) | 12.1       | 20          |
| Silicon    |                       |      |                      |          |            |             |
| Silver     | 0.0                   | 12.4 | 20.4                 | 60.9N(a) | 14.9       | 20          |
| Sodium     |                       |      |                      |          |            |             |
| Strontium  |                       |      |                      |          |            |             |
| Thallium   | anr                   |      |                      |          |            |             |
| Tin        |                       |      |                      |          |            |             |
| Titanium   |                       |      |                      |          |            |             |
| Uranium    |                       |      |                      |          |            |             |
| Vanadium   | anr                   |      |                      |          |            |             |
| Zinc       | anr                   |      |                      |          |            |             |

Associated samples MP32054: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA32064  
 Account: ERORCODN - ERO Resources Corporation  
 Project: RFTA MOC

QC Batch ID: MP32054  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 01/28/21

| Metal | DA32063-1<br>Original MSD | SpikeLot<br>ICPALL2 % Rec | MSD<br>RPD | QC<br>Limit |
|-------|---------------------------|---------------------------|------------|-------------|
|-------|---------------------------|---------------------------|------------|-------------|

(N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested  
 (a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.  
 (b) High RPD due to possible sample matrix or nonhomogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA32064  
 Account: ERORCODN - ERO Resources Corporation  
 Project: RFTA MOC

QC Batch ID: MP32054  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 01/28/21

| Metal      | BSP<br>Result | SpikeLot<br>ICPALL2 | % Rec | QC<br>Limits |
|------------|---------------|---------------------|-------|--------------|
| Aluminum   | anr           |                     |       |              |
| Antimony   | anr           |                     |       |              |
| Arsenic    | 93.8          | 100                 | 93.8  | 80-120       |
| Barium     | 184           | 200                 | 92.0  | 80-120       |
| Beryllium  | anr           |                     |       |              |
| Boron      |               |                     |       |              |
| Cadmium    | 47.1          | 50                  | 94.2  | 80-120       |
| Calcium    |               |                     |       |              |
| Chromium   | 47.1          | 50                  | 94.2  | 80-120       |
| Cobalt     | anr           |                     |       |              |
| Copper     | anr           |                     |       |              |
| Iron       | anr           |                     |       |              |
| Lead       | 95.8          | 100                 | 95.8  | 80-120       |
| Lithium    |               |                     |       |              |
| Magnesium  |               |                     |       |              |
| Manganese  | anr           |                     |       |              |
| Molybdenum |               |                     |       |              |
| Nickel     | anr           |                     |       |              |
| Phosphorus | anr           |                     |       |              |
| Potassium  |               |                     |       |              |
| Selenium   | 93.7          | 100                 | 93.7  | 80-120       |
| Silicon    |               |                     |       |              |
| Silver     | 17.9          | 20                  | 89.5  | 80-120       |
| Sodium     |               |                     |       |              |
| Strontium  |               |                     |       |              |
| Thallium   | anr           |                     |       |              |
| Tin        |               |                     |       |              |
| Titanium   |               |                     |       |              |
| Uranium    |               |                     |       |              |
| Vanadium   | anr           |                     |       |              |
| Zinc       | anr           |                     |       |              |

Associated samples MP32054: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

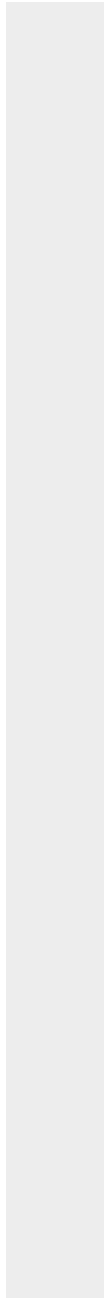
QC Batch ID: MP32054  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 01/28/21

| Metal | BSP<br>Result | Spike lot<br>ICPALL2 | % Rec | QC<br>Limits |
|-------|---------------|----------------------|-------|--------------|
|-------|---------------|----------------------|-------|--------------|

(anr) Analyte not requested



SERIAL DILUTION RESULTS SUMMARY

Login Number: DA32064  
 Account: ERORCODN - ERO Resources Corporation  
 Project: RFTA MOC

QC Batch ID: MP32054  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 01/28/21

| Metal      | DA32063-1<br>Original | SDL 1:5 | %DIF     | QC<br>Limits |
|------------|-----------------------|---------|----------|--------------|
| Aluminum   | anr                   |         |          |              |
| Antimony   | anr                   |         |          |              |
| Arsenic    | 23.3                  | 57.5    | 141.6(a) | 0-10         |
| Barium     | 864                   | 908     | 5.0      | 0-10         |
| Beryllium  | anr                   |         |          |              |
| Boron      |                       |         |          |              |
| Cadmium    | 0.00                  | 0.00    | NC       | 0-10         |
| Calcium    |                       |         |          |              |
| Chromium   | 26.8                  | 25.0    | 4.2      | 0-10         |
| Cobalt     | anr                   |         |          |              |
| Copper     | anr                   |         |          |              |
| Iron       | anr                   |         |          |              |
| Lead       | 321                   | 361     | 12.4*(b) | 0-10         |
| Lithium    |                       |         |          |              |
| Magnesium  |                       |         |          |              |
| Manganese  | anr                   |         |          |              |
| Molybdenum |                       |         |          |              |
| Nickel     | anr                   |         |          |              |
| Phosphorus | anr                   |         |          |              |
| Potassium  |                       |         |          |              |
| Selenium   | 0.00                  | 0.00    | NC       | 0-10         |
| Silicon    |                       |         |          |              |
| Silver     | 0.00                  | 0.00    | NC       | 0-10         |
| Sodium     |                       |         |          |              |
| Strontium  |                       |         |          |              |
| Thallium   | anr                   |         |          |              |
| Tin        |                       |         |          |              |
| Titanium   |                       |         |          |              |
| Uranium    |                       |         |          |              |
| Vanadium   | anr                   |         |          |              |
| Zinc       | anr                   |         |          |              |

Associated samples MP32054: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: DA32064  
 Account: ERORCODN - ERO Resources Corporation  
 Project: RFTA MOC

QC Batch ID: MP32054  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 01/28/21

| Metal | DA32063-1 |              | QC Limits |
|-------|-----------|--------------|-----------|
|       | Original  | SDL 1:5 %DIF |           |

- (anr) Analyte not requested  
 (a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).  
 (b) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

QC Batch ID: MP32056  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 01/28/21

| Metal   | RL    | IDL    | MDL  | MB<br>raw | final  |
|---------|-------|--------|------|-----------|--------|
| Mercury | 0.083 | .00088 | .033 | 0.00040   | <0.083 |

Associated samples MP32056: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA32064  
 Account: ERORCODN - ERO Resources Corporation  
 Project: RFTA MOC

QC Batch ID: MP32056  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 01/28/21

| Metal   | DA32063-1 |      | Spike lot |       | QC     |
|---------|-----------|------|-----------|-------|--------|
|         | Original  | MS   | HGWSR1    | % Rec | Limits |
| Mercury | 0.041     | 0.40 | 0.337     | 106.5 | 75-125 |

Associated samples MP32056: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

7.2.2

7



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA32064  
 Account: ERORCODN - ERO Resources Corporation  
 Project: RFTA MOC

QC Batch ID: MP32056  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 01/28/21

| Metal   | DA32063-1<br>Original MSD | SpikeLot<br>HGWSR1 | % Rec | MSD<br>RPD | QC<br>Limit |
|---------|---------------------------|--------------------|-------|------------|-------------|
| Mercury | 0.041 0.40                | 0.354              | 101.5 | 0.0        | 20          |

Associated samples MP32056: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA32064  
 Account: ERORCODN - ERO Resources Corporation  
 Project: RFTA MOC

QC Batch ID: MP32056  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 01/28/21

| Metal   | BSP<br>Result | Spike lot<br>HGWSR1 | % Rec | QC<br>Limits |
|---------|---------------|---------------------|-------|--------------|
| Mercury | 0.36          | 0.333               | 108.0 | 80-120       |

Associated samples MP32056: DA32064-1, DA32064-2, DA32064-3

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested



## General Chemistry

### QC Data Summaries

∞

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte            | Batch ID        | RL  | MB<br>Result | Units | Spike<br>Amount | BSP<br>Result | BSP<br>%Recov | QC<br>Limits |
|--------------------|-----------------|-----|--------------|-------|-----------------|---------------|---------------|--------------|
| HEM Oil and Grease | GP28523/GN52421 | 250 | 0.00         | mg/kg | 800             | 720           | 90.0          | 70-130%      |

Associated Samples:

Batch GP28523: DA32064-1, DA32064-2, DA32064-3  
(\*) Outside of QC limits

8.1

8

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte         | Batch ID | QC Sample | Units | Original Result | DUP Result | RPD | QC Limits |
|-----------------|----------|-----------|-------|-----------------|------------|-----|-----------|
| Solids, Percent | GN52374  | DA32100-1 | %     | 93.3            | 93.4       | 0.1 | 0-10%     |

Associated Samples:

Batch GN52374: DA32064-1, DA32064-2, DA32064-3, DA32064-4, DA32064-5  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte            | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MS Result | %Rec | QC Limits |
|--------------------|-----------------|-----------|-------|-----------------|--------------|-----------|------|-----------|
| HEM Oil and Grease | GP28523/GN52421 | DA32064-1 | mg/kg | 0.00            | 977          | 952       | 95.0 | 65-130%   |

Associated Samples:

Batch GP28523: DA32064-1, DA32064-2, DA32064-3

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

8.3

8

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA32064  
Account: ERORCODN - ERO Resources Corporation  
Project: RFTA MOC

| Analyte            | Batch ID        | QC Sample | Units | Original Result | Spike Amount | MSD Result | RPD  | QC Limit |
|--------------------|-----------------|-----------|-------|-----------------|--------------|------------|------|----------|
| HEM Oil and Grease | GP28523/GN52421 | DA32064-1 | mg/kg | 0.00            | 977          | 855        | 10.7 | 30%      |

Associated Samples:

Batch GP28523: DA32064-1, DA32064-2, DA32064-3

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

8.4

8





September 24, 2021

VIA EMAIL

NICHOLAS SENN  
ROARING FORK TRANSPORTATION AUTHORITY  
2307 WULFSOHN RD  
GLENWOOD SPRINGS CO 81601

Re: No Further Action (NFA) Determination for Glenwood Municipal Operations Center, 2301 Wulfsohn Rd., Glenwood Springs, Garfield County, Colorado. (Event ID #13987, Release ID #6194, Facility ID #15748)

Dear Nicholas Senn:

The Division of Oil and Public Safety (OPS) has reviewed the NFA request for the referenced site received on September 16, 2021.

Based solely upon the information submitted, which shows that petroleum contamination concentrations are below state cleanup levels, OPS will require no further investigation or remedial action at this time. If conditions change, OPS reserves the right to determine if any additional actions are necessary. This NFA letter is in reference to the removal of the 12,000 gallon aboveground storage tank on February 4, 2021.

Please submit a Site Decommissioning Report to OPS to document well abandonment and site decommissioning activities within 90 days of receiving this NFA Determination. **OPS cannot release you from any liability that may be associated with any contamination at or from this site.**

Please address correspondence regarding this site to me and if you have any questions, please contact me at 303-318-8507 or via email at [michelle.howard@state.co.us](mailto:michelle.howard@state.co.us).

Sincerely,

Michelle Howard  
Environmental Protection Specialist  
Petroleum Program

cc: Craig Sovka, ERO Resources Corp., sent via email



April 25, 2023

Mr. Dustin Goodman  
Facilities Manager  
Roaring Fork Transportation Authority (RFTA)  
1340 Main Street  
Carbondale, CO 81623

**SUBJECT: SITE CHARACTERIZATION REPORT &  
NO FURTHER ACTION REQUEST  
ROARING FORK TRANSPORTATION AUTHORITY (RFTA)  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601  
FACILITY #15558, EVENT #17254**

Dear Mr. Goodman:

This report documents the soil sampling and analysis performed by Tait Environmental Services, Inc. (TAIT) at the Roaring Fork Transportation Authority (RFTA) Glenwood Springs facility, located at 2307 Wulfsohn Road in Glenwood Springs, CO (site-Figure 1). Site Characterization was required by the Division of Oil and Public Safety – Petroleum Remediation Section. The Facility ID is #15558, and the Event ID is #17254. This Site Characterization Report (SCR) is being submitted in combination with a No Further Action Request (NFAR).

On November 2, 2022, the Colorado Division of Oil and Public Safety (OPS) received notification of a confirmed release at the site due to a piping sump testing failure. The OPS issued an Event Letter on November 7, 2022, requiring that a Site Characterization be performed at the site. A copy of the Event Letter is contained in Attachment A.

The Site Characterization activities were undertaken to determine if soil and/or groundwater contamination was present in the strata adjacent to the 1,000-gallon old oil underground storage tank (UST), designated as Tank #4. On April 11, 2023, a geophysical survey was completed at the site to determine the footprint of the tank, tank excavation, and adjacent underground fuel and vent lines. On April 12, 2023, a site assessment was completed to sample the soils adjacent to the base of the UST. All samples were submitted to an environmental laboratory for analysis.

## **SITE GEOLOGY AND HYDROGEOLOGY**

The geology of the site and surrounding area was obtained from the following reference:

Kirkham, Robert M., Streufert, Randall K., and Cappa, James A., 1995, Geologic Map of the Glenwood Springs Quadrangle, Garfield County, Colorado, Description of Map Units, Colorado Geological Survey, Division of Minerals and Geology, Department of Natural Resources, Open file 95-3.

According to the above reference, the site is directly underlain by Younger Debris Flows of Holocene age. These sediments consist of poorly sorted, clast-and matrix-supported, pebble and cobble gravel in a sandy silt or silty sand matrix. Fragments consist of sedimentary rock and basalt. In the area of the site, the Younger Debris flows are located directly downhill from the Eagle Valley Formation of Pennsylvania age and the Maroon Formation and Weber Sandstone of Pennsylvania and Permian age. These formations consist of red sandstone, conglomerate, mudstone, siltstone and shale which form the cliffs outcropping above and south of the site.

There was no readily available information concerning the groundwater conditions in the vicinity of the site.

During the soil sampling event at the site, the geology of the natural sediments beneath the site was determined as follows. Pea gravel was noted in borings B1 and B4 to depths ranging from eight (8) feet below ground surface (bgs) in boring B1 to about 13 feet bgs in boring B4. Both of these borings were located within the UST basin. Below these depths, sediments consisted of clayey and silty sands as described below.

Borings B2 and B3 were located outside of the UST basin and consisted primarily of red clayey and silty sands with variable gravel layers from depths of two (2) to 25 feet bgs. These sediments corresponded to the Younger Debris Flows; however, it was not possible to determine whether these sediments were partly foundation backfill that was placed in the area prior to development of the buildings. The provenance for these sediments appears to be from the Pennsylvanian and Permian aged sedimentary rocks in the cliffs above the facility to the south.

Groundwater was not encountered in the sediments; however, the finer grained layers in some of the borings were moist and appeared to be soaking up downward percolating surface water. The coarser grained layers in the borings were dry, indicating that no viable groundwater zone was present within the upper 25 feet of the geologic section in this area of the site.

Soil boring logs are contained in Attachment B.

## **GEOPHYSICAL INVESTIGATION**

On April 11, 2023, TAIT contracted GPRS in Highlands Ranch, CO to perform a geophysical investigation of the UST area. The purpose of the survey was to locate utilities near the current UST system, outline the area of UST excavation, the USTs, and any underground piping lines as much as possible to allow for location of four (4) soil borings adjacent to the UST. A copy of the GPRS report is contained in Attachment C.

## **SOIL SAMPLING**

On April 12, 2023, TAIT advanced 4 direct-push soil borings (B1, B2, B3, and B4) using a track-mounted Geoprobe 7822DT operated by Vista Geoscience of Golden, Colorado. Vista submitted a locates request to Colorado 811 (Ticket #A309302509-00A) in advance of drilling activities. To ensure that no lines were located adjacent to the UST, Vista potholed each boring to a depth of five (5) feet bgs.

Soil borings B1, B2, and B4 were each completed to a total depth of 25 feet bgs. Boring B3 met refusal at a depth of 22 feet bgs. Based on tank measurements and the geophysical results, it was determined that Tank #4 was within 18 inches of Tank #3 (2,000-gallon new oil tank), and it was determined that a soil boring could not be safely completed between the two USTs. As a result, the soil borings were located on the northern, western, and southern sides of Tank #4 in the locations shown on the Soil Boring Location Map (Figure 2).

Soil samples were collected at depths of 15 and 25 feet bgs (22 feet bgs in boring B3) in each boring. The 15-foot depth was representative of the soils beneath the tank basin, and consisted of the following samples:

B1-15  
B2-15  
B3-15  
B4-15

Soil samples were collected from the 25-foot depth in accordance with the OPS "Guidance for Spill Bucket Assessment", which was dated March 3, 2021, and consisted to the following samples:

B1-25  
B2-25  
B3-22  
B4-25

All soil samples were transferred from the acetate tubes directly into pre-cleaned, laboratory-supplied, Teflon-lined, 4-ounce glass jars. The glass jars were labeled and placed immediately into an iced cooler prior to transport to the analytical laboratory.

During the completion of the soil borings, volatile organic compound (VOC) readings in parts per million (ppm) were taken with a Mini-Rae 2000 photoionization detector (PID) at various depth intervals in each of the soil borings. None of the readings detected VOCs above 0.0 ppm. The PID readings are shown on the boring logs in Attachment B. Visual and olfactory observations of the soils did not indicate the presence of petroleum hydrocarbons in any of the samples.

## **LABORATORY ANALYSIS**

All soil samples collected at the site were transported under standard chain-of-custody protocols to Origins Laboratory, Inc. in Denver, CO within 24 hours of sample collection. All samples were submitted for analysis for Total Petroleum Hydrocarbons (TPH) as Gasoline (C6-C10), Diesel (C10-C28) and Residual Range Organics (C28-C40) using EPA Method 8015D. All soil samples were also analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether MTBE using EPA Method 8260D. Origins is a NELAP certified laboratory.

Gasoline, Diesel, Residual Range Organics, BTEX, and MTBE were not detected in any of the soil samples above their respective Laboratory Reporting Limits. As there were no TPH detections, analysis for Polycyclic Aromatic Hydrocarbons (PHHs) was not performed on any of the samples. The laboratory report and chain-of-custody documentation for the soil samples are included in Attachment D.

## **CONCLUSION**

Based on the analytical results, no further work is recommended with respect to the UST at the site, and no further action is requested.

## **WASTE HANDLING**

Potholed soil and borehole soil cuttings were generated during the drilling event. Based on the analytical results of the soil sampling, the waste soils obtained during the drilling event did not contain detectable concentrations of DRO, MORO, GRO, BTEX, and MTBE. These soils were transported off site to Raritan CWT of Englewood, CO under a non-hazardous waste manifest provided by Vista Geoscience. A copy of the manifest is contained in Attachment E.

## LIMITATIONS

A soil sampling report contains professional opinions with respect to environmental issues of concern and/or additional actions that may be addressed at the site. In rendering a professional opinion, TAIT warrants that the services provided hereunder were performed within the limits described and in accordance with current generally accepted environmental consulting principles and practices.

TAIT represents that the services were performed in a manner consistent with industry standards. No other warranty, either expressed or implied, is intended by TAIT.

TAIT is not responsible for any potential impact of the property attributable to this document due to changes in applicable environmental standards, practices or regulations following performance of services. Services hereunder were performed in accordance with TAIT's agreement and understanding with, and solely for the use of the responsible party.

Opinions and/or recommendations are intended for the client, purpose, site, location, time frame and project parameters indicated. TAIT is not responsible for subsequent separation, detachment, or partial use of this document. Any reliance on this report by a third party shall be at such party's sole risk.

Should you have any questions concerning this report, please do not hesitate to contact the undersigned at (714) 719-6869 or via e-mail at [pmccarter@tait.com](mailto:pmccarter@tait.com).

TAIT ENVIRONMENTAL SERVICES, INC.

Sincerely,



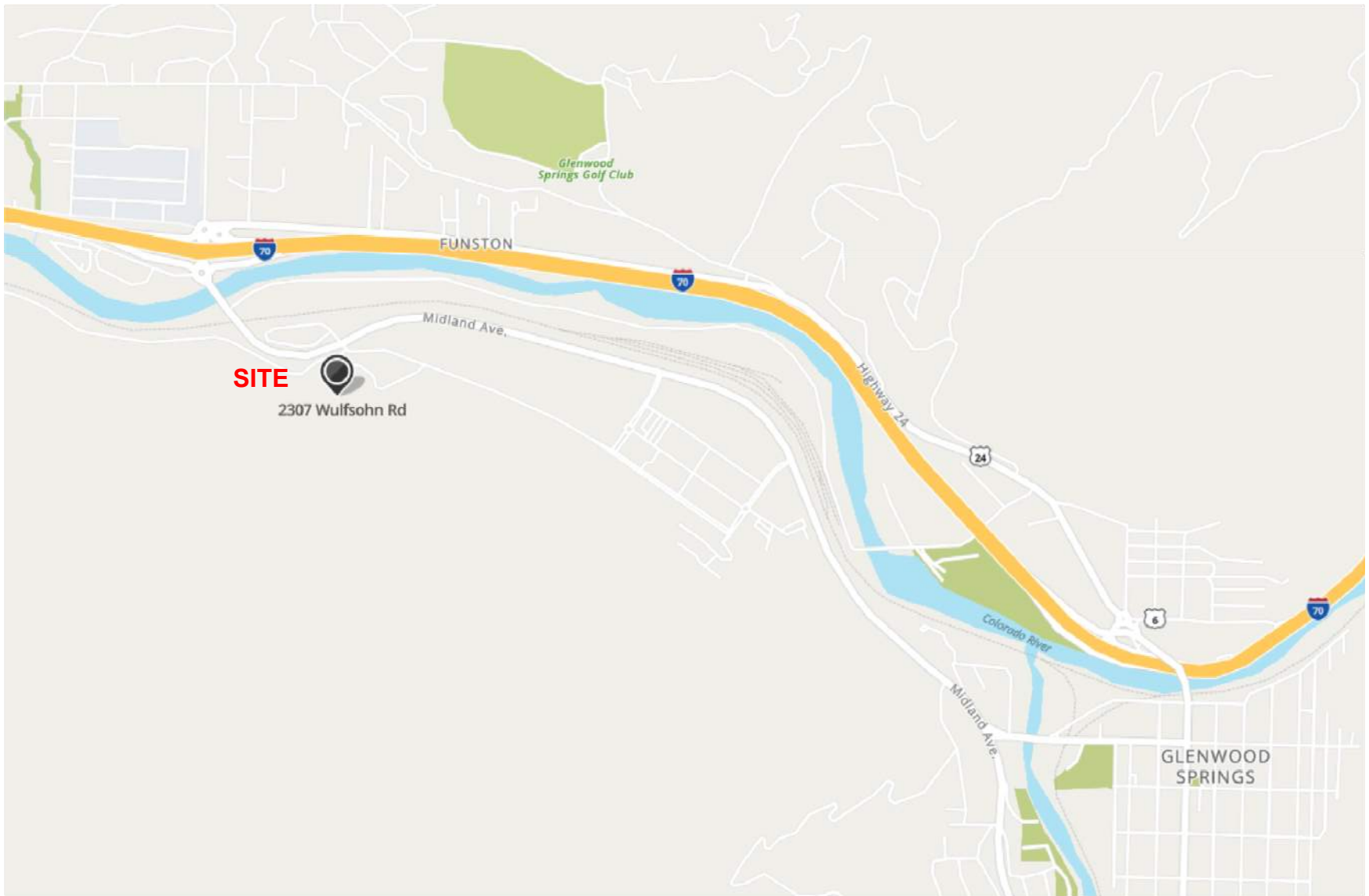
Paul N. McCarter  
Senior Geologist  
Recognized Environmental Professional #9

Attachments:    Figure 1:        Site Location Map  
                     Figure 2:        Soil Boring Location Map  
                     Attachment A: OPS Event Letter  
                     Attachment B: Soil Boring Logs  
                     Attachment C: GPRS Geophysical Investigation Report  
                     Attachment D: Laboratory Analytical Report  
                     Attachment E: Non-hazardous Waste Manifest

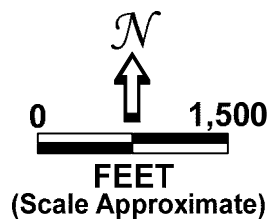
## **ATTACHMENTS**



## **FIGURES**



Base Map from Mapquest, 2023



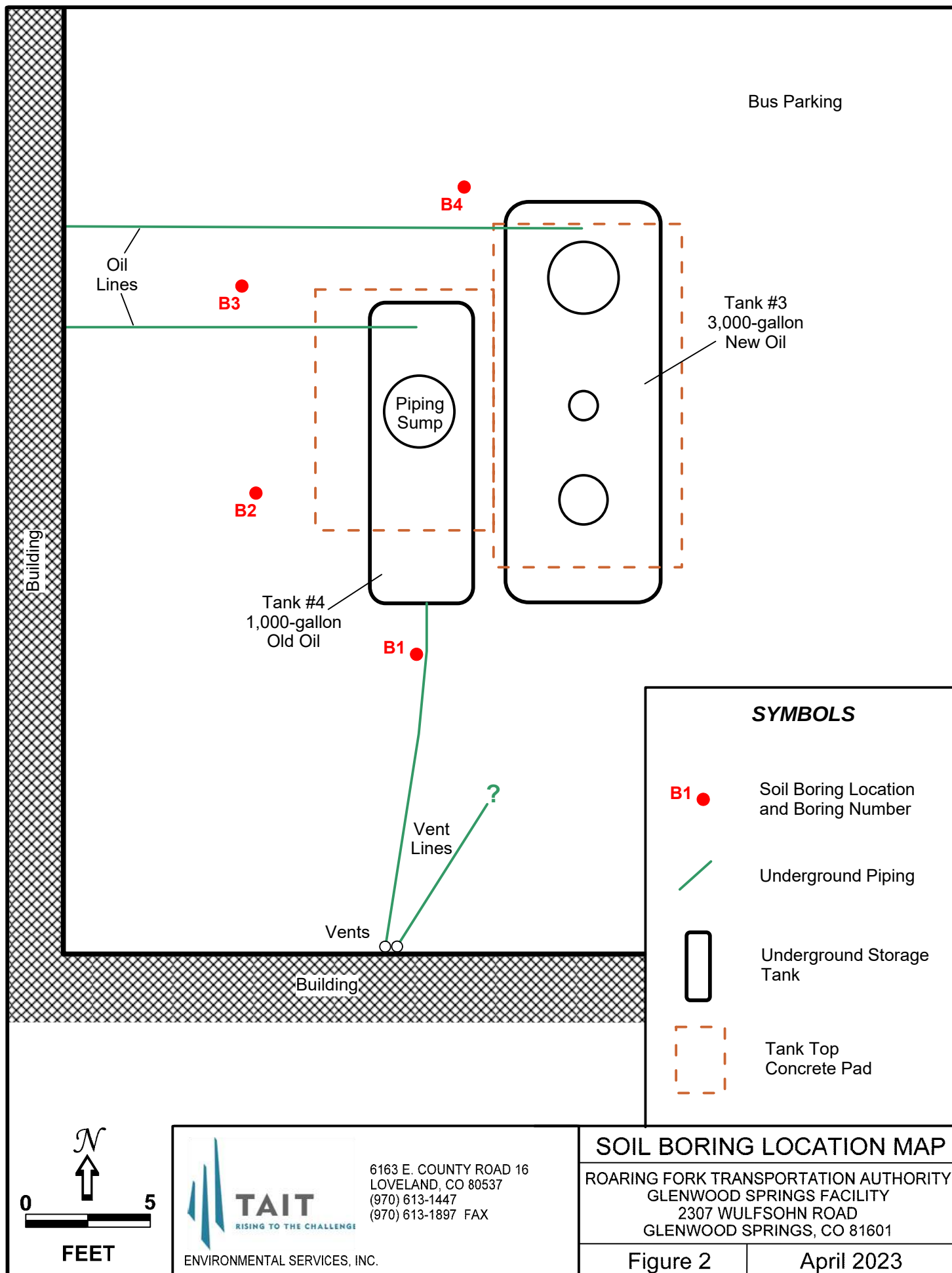
6163 E. COUNTY ROAD 16  
LOVELAND, CO 80537  
(970) 613-1447  
(970) 613-1897 FAX

## SITE LOCATION MAP

ROARING FORK TRANSPORTATION AUTHORITY  
GLENWOOD SPRINGS FACILITY  
2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

Figure 1

April 2023



**ATTACHMENT A**  
**OPS Event Letter**



November 7, 2022

**VIA EMAIL**

Return Receipt Requested

MIKE HERMES  
ROARING FORK  
TRANSPORTATION AUTHORITY  
1340 MAIN ST  
CARBONDALE CO 81623

Re: Request for a Site Characterization Report (SCR) for Roaring Fork Transit Agency, 2307 Wulfsohn Rd., Glenwood Springs, Garfield County, Colorado (Event ID #17254, Release #16242, Facility ID #15558)

Dear Mike Hermes:

The Division of Oil and Public Safety (OPS) has received notification of a confirmed release on November 2, 2022, at the above-referenced address. As the owner/operator responsible for the release, OPS requests that you perform a Site Characterization according to the Petroleum Storage Tank Regulations and the Petroleum Program Guidance.

The purpose of Site Characterization is to define the extent of release source area(s), determine the distribution of contamination in the subsurface, determine if points of exposure are impacted or potentially impacted, evaluate all exposure pathways, and determine whether active remediation is needed. Appropriate pilot testing should be completed and reported in the SCR if active remediation is needed. You should obtain access to off-site properties, including rights-of-way, if the extent of contamination is beyond the release property boundary.

Site characterization results should be submitted to OPS within 180 days of the release discovery (by **May 1, 2023**) using the combined format provided on the OPS website. Failure to submit a complete SCR within 180 days will result in violation of the regulations and will subject you to penalties and enforcement as described in the Petroleum Storage Tank Statutes.

OPS encourages you to retain a Recognized Environmental Professional (REP) to complete the Site Characterization activities described. Responsible parties must identify a REP in order to seek reimbursement from the Petroleum Storage Tank Fund within the Reasonable Cost Guidelines.



In addition to the Site Characterization, appropriate repairs and/or replacements are required within 30 days of discovering the failure. Submit the minor equipment form to [cdle\\_oil\\_inspection@state.co.us](mailto:cdle_oil_inspection@state.co.us) by (December 2, 2022). If the release is from an underground storage tank system, a Qualified Service Technician must complete the repairs or replacement of the equipment

Your cooperation in addressing this release event is appreciated and communication with OPS during characterization is recommended. You may contact the technical reviewer, Murray Brown at (303) 728-4849 or [murray.brown@state.co.us](mailto:murray.brown@state.co.us), if you have any questions.

Sincerely,



Michelle Howard  
Release Coordinator  
Petroleum Program

cc: Murray Brown, OPS Area Inspector/EPS, sent via email  
Dustin Goodman, Roaring Fork Transit Agency, sent via email



**ATTACHMENT B**  
**Soil Boring Logs**





6163 E. COUNTY ROAD 16  
LOVELAND, CO 80537  
(970) 613-1447  
(970) 613-1897 FAX

BORING/WELL NO.

**B1**

|                                                               |                                    |
|---------------------------------------------------------------|------------------------------------|
| PROJECT: Roaring Fork Transportation Authority (RFTA)         | PROJECT NUMBER: RFTA2022           |
| ADDRESS: 2307 Wulfsohn Road, Glenwood Springs CO              | LOGGED BY: Paul McCarter           |
| START DATE: 4-12-23      COMPLETION DATE: 4-12-23             | CHECKED BY:                        |
| GROUND SURFACE ELEVATION (ft-msl): 5832                       | DRILLING COMPANY: Vista Geoscience |
| DRILLING EQUIPMENT: Track-mounted Geoprobe 7822DT             |                                    |
| BORING DEPTH (ft): 25      WELL DEPTH (ft): N/A               | INITIAL WATER DEPTH (ft): N/A      |
| WELL CASING ELEVATION (ft): N/A                               | WELL SCREEN INTERVAL (ft):         |
| WELL MATERIALS: N/A                                           | OVM/OVA: Mini-Rae                  |
| BACKFILL MATERIAL: Bentonite chips (hydrated); concrete patch |                                    |

| OVM/OVA (ppm) | BLOW COUNTS | RECOVERY (%) | SAMPLE NUMBER | SAMPLE COLLECTION TIME | SAMPLE INTERVAL | DEPTH (FT BGS) | USCS LOG | GRAPHIC LOG | LITHOLOGIC DESCRIPTION                                                                                                                      |
|---------------|-------------|--------------|---------------|------------------------|-----------------|----------------|----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|               |             |              |               |                        |                 |                | GW       |             | CONCRETE (REINFORCED - 7")<br>GRAVEL: pea gravel in tank basin, up to 1 inch.                                                               |
| 0             |             | 10           |               |                        |                 | 5              |          |             |                                                                                                                                             |
|               |             |              |               |                        |                 |                | SW       |             | GRAVELLY SAND: red (10Y, 4/6), fine- medium-grained, up to 20% gravel layers to 1/4", dense, dry, possibly foundation backfill.             |
| 0             |             | 60           | B1-15         | 3:05                   |                 | 10             |          |             |                                                                                                                                             |
|               |             |              |               |                        |                 |                | SC       |             | CLAYEY SAND: red (10Y, 4/6), up to 60% fine-grained sand, gravel layers, gravel to 1" or greater, dense, dry, possibly foundation backfill. |
| 0             |             | 60           |               |                        |                 | 15             |          |             |                                                                                                                                             |
|               |             |              |               |                        |                 |                |          |             | as above, decrease in number of gravel layers, dense, dry, possibly foundation backfill.                                                    |
| 0             |             |              |               |                        |                 | 20             |          |             |                                                                                                                                             |
|               |             |              |               |                        |                 |                |          |             | as above, decrease in gravel layers, dense, dry, possibly foundation backfill.                                                              |
| 0             |             | 20           | B1-25         | 3:15                   |                 |                |          |             |                                                                                                                                             |

|                                                               |                                    |
|---------------------------------------------------------------|------------------------------------|
| PROJECT: Roaring Fork Transportation Authority (RFTA)         | PROJECT NUMBER: RFTA2022           |
| ADDRESS: 2307 Wulfsohn Road, Glenwood Springs CO              | LOGGED BY: Paul McCarter           |
| START DATE: 4-12-23      COMPLETION DATE: 4-12-23             | CHECKED BY:                        |
| GROUND SURFACE ELEVATION (ft-msl): 5832                       | DRILLING COMPANY: Vista Geoscience |
| DRILLING EQUIPMENT: Track-mounted Geoprobe 7822DT             |                                    |
| BORING DEPTH (ft): 25                                         | WELL DEPTH (ft): N/A               |
| INITIAL WATER DEPTH (ft): N/A                                 |                                    |
| WELL CASING ELEVATION (ft): N/A                               | WELL SCREEN INTERVAL (ft):         |
| WELL MATERIALS: N/A                                           | OVM/OVA: Mini-Rae                  |
| BACKFILL MATERIAL: Bentonite chips (hydrated); concrete patch |                                    |

| OVM/OVA (ppm) | BLOW COUNTS | RECOVERY (%) | SAMPLE NUMBER | SAMPLE COLLECTION TIME | SAMPLE INTERVAL | DEPTH (FT BGS) | USCS LOG | GRAPHIC LOG | LITHOLOGIC DESCRIPTION                                                                                                                                                                                    |
|---------------|-------------|--------------|---------------|------------------------|-----------------|----------------|----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |             |              |               |                        |                 |                |          |             |                                                                                                                                                                                                           |
|               |             |              |               |                        |                 |                | GW       |             |                                                                                                                                                                                                           |
|               |             |              |               |                        |                 |                | SC       |             | CONCRETE (reinforced - 7")<br>GRAVEL: pea gravel up to 1 inch.<br>CLAYEY SAND: red (10Y, 4/6), fine-grained, up to 30% clay and silt, gravel and cobble layers, dense, dry, possibly foundation backfill. |
| 0             | 20          |              |               |                        |                 | 5              |          |             | as above, gravel layers, gravel to 1", dense, some gravel layers are moist, possibly foundation backfill.                                                                                                 |
|               |             |              |               |                        |                 | 10             |          |             |                                                                                                                                                                                                           |
|               |             |              |               |                        |                 |                | SM       |             | SILTY SAND: red (10Y, 4/6), fine-grained, up to 40% silt and clay, gravel layers, some broken cobbles, dense, dry, possibly foundation backfill.                                                          |
| 0             | 60          | B2-15        | 3:33          |                        |                 | 15             |          |             |                                                                                                                                                                                                           |
|               |             |              |               |                        |                 |                | SC       |             | CLAYEY SAND: red (10Y, 4/6), fine-grained, up to 40% clay, some gravel layers, clayey layers retaining some moisture, sands and gravels dense, dry, possibly foundation backfill.                         |
| 0             | 50          |              |               |                        |                 | 20             |          |             | as above, decrease in gravel layers, dense, dry, possibly foundation backfill.                                                                                                                            |
|               |             |              |               |                        |                 |                |          |             |                                                                                                                                                                                                           |
| 0             | 30          | B2-25        | 3:40          |                        |                 |                |          |             |                                                                                                                                                                                                           |

BORING/WELL NO.

**B3**

ENVIRONMENTAL SERVICES, INC.

6163 E. COUNTY ROAD 16  
LOVELAND, CO 80537  
(970) 613-1447  
(970) 613-1897 FAX

PROJECT: Roaring Fork Transportation Authority (RFTA)

PROJECT NUMBER: RFTA2022

ADDRESS: 2307 Wulfsohn Road, Glenwood Springs CO

LOGGED BY: Paul McCarter

START DATE: 4-12-23 COMPLETION DATE: 4-12-23

CHECKED BY:

GROUND SURFACE ELEVATION (ft-msl): 5832

DRILLING COMPANY: Vista Geoscience

DRILLING EQUIPMENT: Track-mounted Geoprobe 7822DT

BORING DEPTH (ft): 22

WELL DEPTH (ft): N/A

INITIAL WATER DEPTH (ft): N/A

WELL CASING ELEVATION (ft): N/A

WELL SCREEN INTERVAL (ft):

WELL MATERIALS: N/A

OVM/OVA: Mini-Rae

BACKFILL MATERIAL: Bentonite chips (hydrated); concrete patch

| OVM/OVA (ppm) | BLOW COUNTS | RECOVERY (%) | SAMPLE NUMBER | SAMPLE COLLECTION TIME | SAMPLE INTERVAL | DEPTH (FT BGS) | USCS LOG | GRAPHIC LOG | LITHOLOGIC DESCRIPTION                                                                                                                    |
|---------------|-------------|--------------|---------------|------------------------|-----------------|----------------|----------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|               |             |              |               |                        |                 |                | GW       |             | CONCRETE (REINFORCED - 7")                                                                                                                |
|               |             |              |               |                        |                 |                | SC       |             | GRAVEL: pea gravel up to 1 inch.                                                                                                          |
|               |             |              |               |                        |                 |                |          |             | CLAYEY SAND: red (10Y, 4/6), fine-grained, up to 30% clay and silt, gravel and cobble layers, dense, dry, possibly foundation backfill.   |
|               |             |              |               |                        |                 | 5              |          |             |                                                                                                                                           |
| 0             | 25          |              |               |                        |                 | 10             |          |             | as above, fine-grained sand, up to 20% gravel layers, gravel to 1", dry, dense, possibly foundation backfill.                             |
| 0             | 60          | B3-15        | 4:00          |                        |                 | 15             |          |             | as above, <10% gravel layers, dense, dry to slightly moist, possibly foundation backfill.                                                 |
|               |             |              |               |                        |                 |                | SM       |             | SILTY SAND: red (10Y, 4/6), up to 60% fine-grained sand, up to 20% gravel layers, gravel to 1", dense, dry, possibly foundation backfill. |
| 0             | 30          |              |               |                        |                 | 20             |          |             |                                                                                                                                           |
| 0             | 20          | B3-22        | 4:10          |                        |                 |                |          |             | refusal at 22'.                                                                                                                           |

BORING/WELL NO.

**B4**

6163 E. COUNTY ROAD 16  
LOVELAND, CO 80537  
(970) 613-1447  
(970) 613-1897 FAX

ENVIRONMENTAL SERVICES, INC.

PROJECT: Roaring Fork Transportation Authority (RFTA)

PROJECT NUMBER: RFTA2022

ADDRESS: 2307 Wulfsohn Road, Glenwood Springs CO

LOGGED BY: Paul McCarter

START DATE: 4-12-23 COMPLETION DATE: 4-12-23

CHECKED BY:

GROUND SURFACE ELEVATION (ft-msl): 5832

DRILLING COMPANY: Vista Geoscience

DRILLING EQUIPMENT: Track-mounted Geoprobe 7822DT

BORING DEPTH (ft): 25

WELL DEPTH (ft): N/A

INITIAL WATER DEPTH (ft): N/A

WELL CASING ELEVATION (ft): N/A

WELL SCREEN INTERVAL (ft):

WELL MATERIALS: N/A

OVM/OVA: Mini-Rae

BACKFILL MATERIAL: Bentonite chips (hydrated); concrete patch

| OVM/OVA (ppm) | BLOW COUNTS | RECOVERY (%) | SAMPLE NUMBER | SAMPLE COLLECTION TIME | SAMPLE INTERVAL | DEPTH (FT BGS) | USCS LOG | GRAPHIC LOG | LITHOLOGIC DESCRIPTION                                                                                            |
|---------------|-------------|--------------|---------------|------------------------|-----------------|----------------|----------|-------------|-------------------------------------------------------------------------------------------------------------------|
| 0             | 20          |              |               |                        |                 |                | GW       |             | CONCRETE (REINFORCED - 7")<br>GRAVEL: pea gravel in tank basin, up to 1 inch.                                     |
| 0             | 20          | B4-15        | 4:35          |                        |                 | 15             | SC       |             | CLAYEY SAND: red (10Y, 4/6), up to 50% fine-grained sand, 10% gravel layers, gravel to 1", dense, slightly moist. |
| 0             | 40          |              |               |                        |                 |                |          |             | as above, 30% gravel layers, gravel to 1", dense, dry, possibly foundation backfill.                              |
| 0             | 20          | B4-25        | 4:40          |                        |                 |                |          |             | as above, finer grained layers are slightly moist, sand and gravel are dense, dry, possibly foundation backfill.  |

**ATTACHMENT C**  
**GPRS Geophysical Investigation Report**



# Summary of Scanning for Underground Storage Tanks (UST's)

---

Prepared For: TAIT & Associates

Prepared By:  
Stanley Jones  
stanley.jones@gprsinc.com  
Project Manager-Denver  
303.907.8348  
April 12, 2023



April 12, 2023

TAIT & Associates

**Attn:** Paul McCarter

**Site:** 2307 Wulfsohn Rd, Glenwood Springs, CO 81601

We appreciate the opportunity to provide this report for our work completed on April 11, 2023.

## **PURPOSE**

The purpose of this project was to determine the dimensions of underground storage tanks (USTs), suspected UST-related piping/anomalies remaining on the property and to determine the extents of the backfilled area containing USTs. The scope of work consisted of one location containing two tanks measuring approximately 40'x40'. The interiors of buildings were excluded from the scope of this project. The client marked the desired locations prior to our scanning and our markings were then placed onto the surface using paint.

## **EQUIPMENT**

- **Underground Scanning GPR Antenna.** The antenna with frequencies ranging from 250 MHz-450 MHz is mounted in a stroller frame which rolls over the surface. The surface needs to be reasonably smooth and unobstructed in order to obtain readable scans. Obstructions such as curbs, landscaping, and vegetation will limit the feasibility of GPR. The data is displayed on a screen and marked in the field in real time. The total depth achieved can be as much as 8' or more with this antenna but can vary widely depending on the types of materials being scanned through. Some soil types such as clay may limit maximum depths to 3' or less. As depth increases, targets must be larger in order to be detected and non-metallic targets can be especially difficult to locate. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors. For more information, please visit: [Link](#)
- **Electromagnetic Pipe Locator.** The EM locator can passively detect the electromagnetic fields from live AC power or from radio signals travelling along some conductive utilities. It can also be used in conjunction with a transmitter to connect directly to accessible, metallic pipes or tracer wires. A current is sent through the pipe or tracer wire at a specific frequency and the resulting EM field can then be detected by the receiver. A utility's ability to be located depends on a variety of factors including access to the utility, conductivity, grounding, interference from other fields, and many others. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors. For more information, please visit: [Link](#)
- **GPS.** This handheld GPS unit offers accuracy down to 4 inches; however, the accuracy will depend on the satellite environment and obstructions and should not be considered to be survey-grade. Features can be collected as points, lines, or areas and then exported into Google Earth or overlaid on a CAD drawing. For more information, please visit: [Link](#)
- **Magnetometer.** The magnetometer detects the magnetic field of a ferromagnetic object. It responds to the difference in the magnetic field between two sensors. It is interpreted in the field by listening to changes in frequency as emitted by a speaker on the device. Larger metallic objects can be located at depths of up to 10' or more but total depths will depend on the size, type, shape, and orientation of objects along with the amount of interference from other objects. For more information, please visit: [Link](#)



## **PROCESS**

The EM pipe locator was used to connect to accessible, traceable pipes that may be tank-related such as vent pipes or product lines. A current is induced onto the pipe which creates an electromagnetic field that can be traced using the receiver. We can then attempt to trace these pipes to their origin or end point and paint or flag their locations.

Initial GPR scans were collected in order to evaluate the data and calibrate the equipment. Based on these findings, a scanning strategy is formed, consisting of scanning the entire area in a grid with 2' scan spacing in order to locate any potential UST's that may remain at the site. The GPR data is viewed in real time and anomalies in the data were located and marked on the surface along with their depths using paint. Relevant scan examples were saved and will be provided in this report.

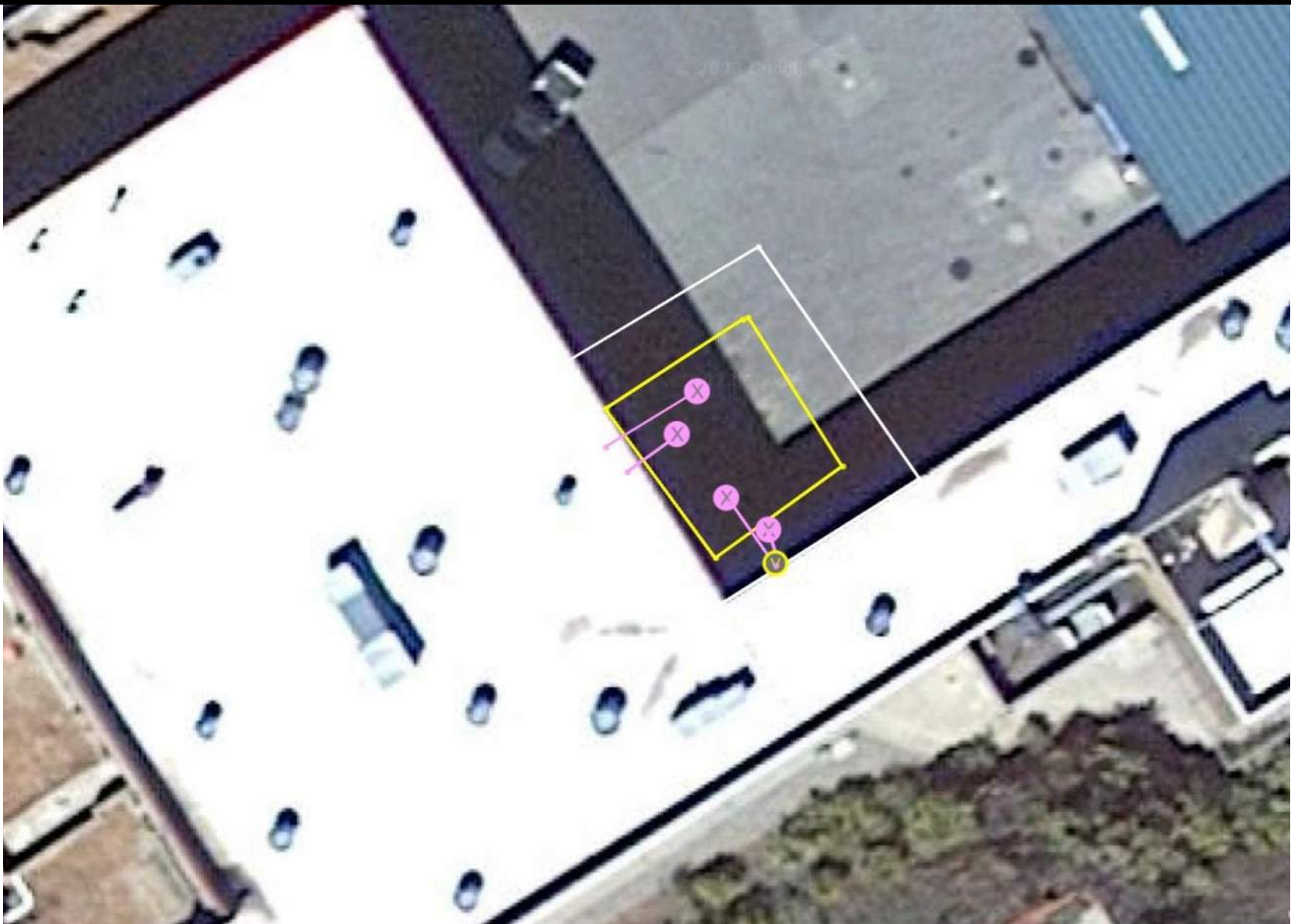
The magnetometer was used to sweep the site every 3'-5' to search for readings that may represent buried, ferrous objects. Upon detection, the readings will be marked on the surface and then investigated from multiple directions and with other methods such as GPR.

## **LIMITATIONS**

Please keep in mind that there are limitations to any subsurface investigation. The equipment may not achieve maximum effectiveness due to soil conditions, above ground obstructions, reinforced concrete, and a variety of other factors. No subsurface investigation or equipment can provide a complete image of what lies below. Our results should always be used in conjunction with as many methods as possible including consulting existing plans and drawings, exploratory excavation or potholing, visual inspection of above-ground features, and utilization of services such as One Call/811. Depths are dependent on many factors so depth accuracy can vary throughout a site and should be treated as estimates only. Relevant scan examples were saved and will be provided in this report.

## **FINDINGS**

The subsurface conditions at the time of the scanning allowed for maximum GPR depth penetration of 3-5' in most areas. Multiple utilities were observed during the scanning; however, utility locating was not part of the scope of this project. The equipment and methods used did detect reactions from potential UST's. Reactions from UST's were only visible in select areas. As a result, approximate boundaries of tanks were unable to be determined. Approximate extents of tank basin backfill were able to be determined and were marked on the surface. Tank associated lines were found and marked on the surface. The following pages will provide further explanation of the findings.



Prepared for: TAIT & Associates  
 Prepared By: Stanley Jones  
 Date of Scanning: 4/11/23

**Terms and Conditions**

GPRS does not provide land survey or civil engineering data collection or documentation. This is provided as a reference map of the field markings and is not survey-grade.

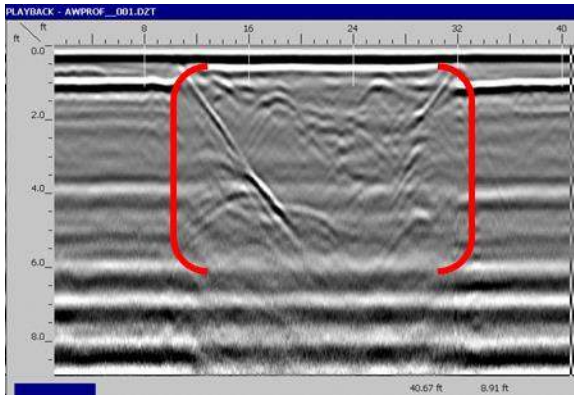
**LEGEND**

|  |            |  |                    |
|--|------------|--|--------------------|
|  | ELECTRIC   |  | SANITARY           |
|  | WATER      |  | STORM              |
|  | COMM       |  | TANK RELATED LINES |
|  | TANK BASIN |  | SCAN AREA          |

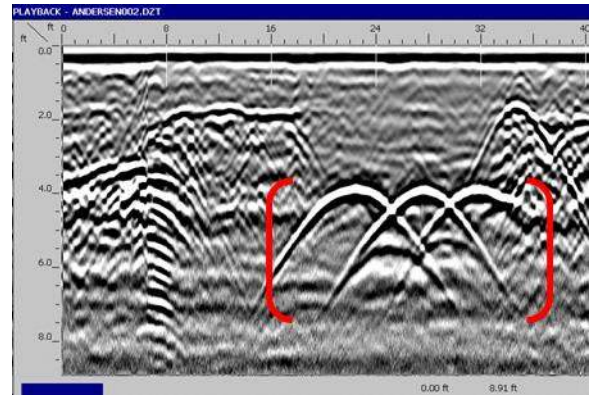
2307 Wulfsohn Rd, Glenwood Springs, CO  
 81601

Prepared by:

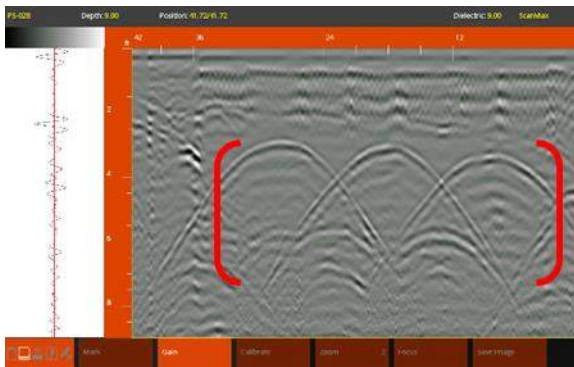




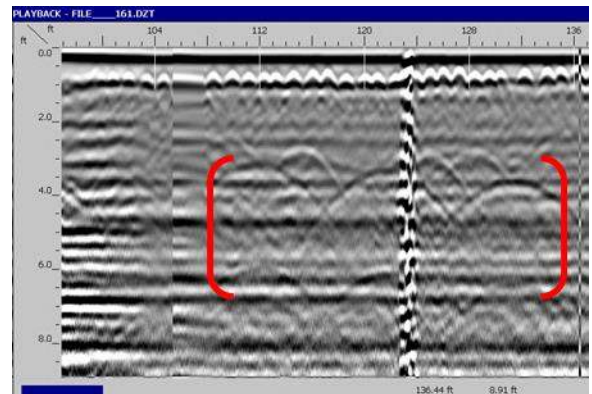
Sample GPR data screenshot showing a possible former tank pit or excavation. The change in the data from the excavation is apparent but GPR cannot determine whether this is due to a tank removal or whether tanks may still exist beyond the maximum depth penetration of the GPR signal.



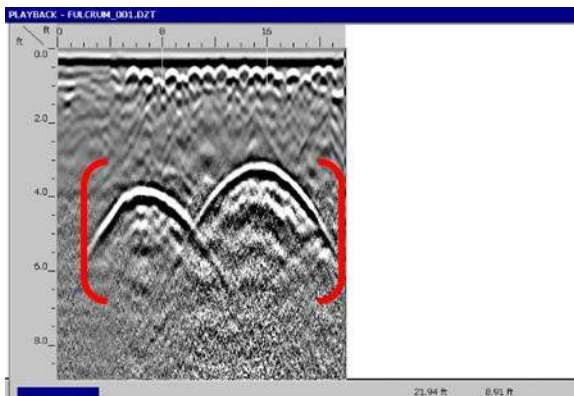
Sample GPR data screenshot showing three reactions from probable USTs. The diameters cannot be determined from these hyperbolas but they can be seen to be larger than a reaction from a typical utility.



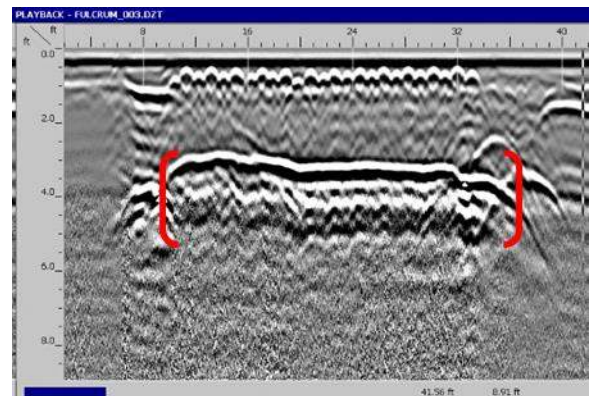
Sample GPR data screenshot showing three reactions from known USTs at an active fueling station. The concrete above the USTs is reinforced with wire mesh.



Sample GPR data screenshot showing three reactions from known USTs at an active fueling station. These USTs are non-metallic and therefore have a weaker reflection that is more difficult and sometimes impossible to identify in the GPR data.



Sample GPR data screenshot showing two potential USTs. These reactions are larger than a typical utility but large utilities can look identical to a UST.



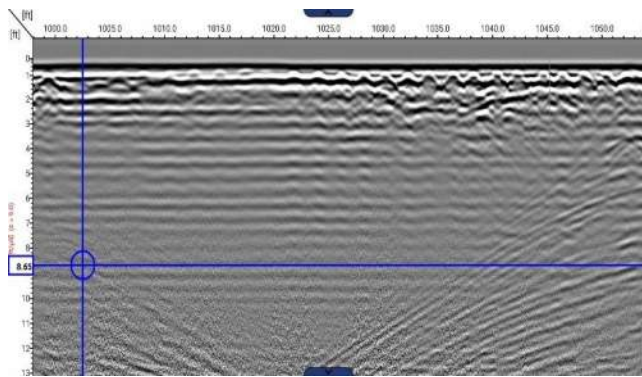
Sample GPR data screenshot showing a scan collected parallel along the top one of the suspected USTs shown in the data to the left. A parallel scan is used to determine a clear beginning and end to the reaction to the reaction which is an indicator of a UST and to determine an approximate length.

Sample Data Screenshots.  
(Not taken from this project)

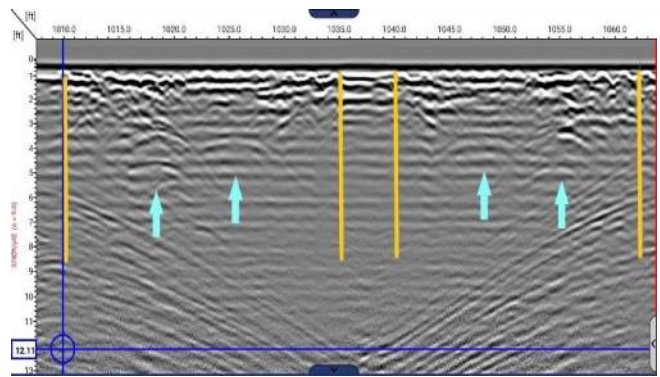
Location:  
previously collected from various sites



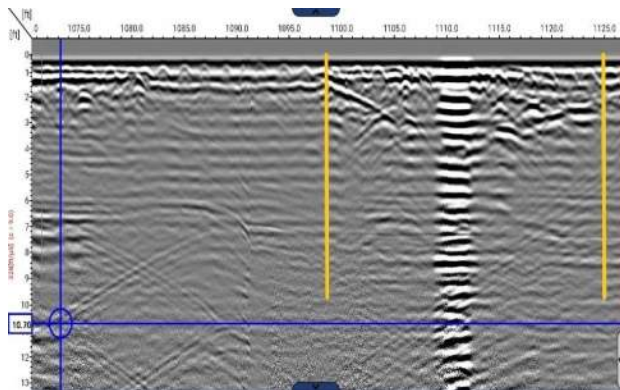




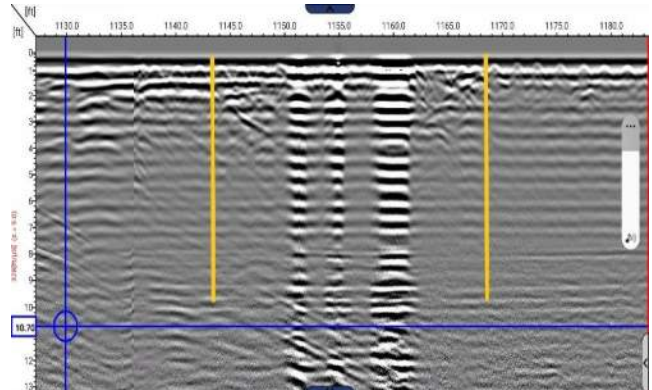
GPR data screenshot showing data typical for the area near the tanks. This scan was not taken over tank basin and no subsurface structures are pictured.



GPR data screenshot showing data consistent with USTs. Left scan taken E-W on south side of tank lids, right scan taken running W-E on north side of tank lids. Blue arrows are pointing to reactions of tanks. Orange lines showing approximate extents of possible tank basin backfill. Tanks only visible with GPR near central tank lids.



GPR screenshot showing scan taken running N-S over westernmost tank. Orange lines showing approximate extents of possible tank basin backfill. Large reaction in center due to tank lid. Length of tank was unable to be determined.



GPR screenshot showing scan taken N-S over easternmost tank. Orange lines show approximate extents of possible tank basin backfill. Three large reactions are caused by tank lids. Tank length was unable to be determined.

GPR Data Screenshots

Location:  
2307 Wulfsohn Rd, Glenwood Springs, CO  
81601





Site photo showing approximate extents of tank basin in pink brackets. Centers of tanks were marked where seen.



Site photo showing vent lines traced from nearby above ground vent. Lines were unable to be traced all the way to tanks and could not be seen using GPR.



Site photo showing two unknown lines at north ends of tanks. Lines were found using passive sweeps and depths were unable to be verified. Lines did not extend past approximate centers of tanks and are believed to be associated with tanks.

GPR Data Screenshots and Photos

2307 Wulfsohn Rd, Glenwood Springs, CO 81601



## **CLOSING**

GPRS, Inc. has been in business since 2001, specializing in underground storage tank location, concrete scanning, utility locating, and shallow void detection for projects throughout the United States. I encourage you to visit our website ([www.gprsinc.com](http://www.gprsinc.com)) and contact any of the numerous references listed.

USTs were able to be seen in a small radius around tank lids of both tanks. Extents of tanks were unable to be determined using GPR. Centers of tanks were marked where they were able to be seen.

Approximate backfill extents of tank basin were able to be determined and were marked on the surface.

Tank associated lines were found and marked. Vent lines at the south end were unable to be traced all the way to either tank from the above ground vents and their depths were unable to be determined. Two unknown lines were found and marked at the north end of each tank and traced running into the nearby garage. Depths of these lines were unable to be determined.

GPRS appreciates the opportunity to offer our services, and we look forward to continuing to work with you on future projects. Please feel free to contact us for additional information or with any questions you may have regarding this report.

Signed,



Stanley Jones  
Project Manager—Denver



Direct: 303.907.8348  
stanley.jones@gprsinc.com  
[www.gprsinc.com](http://www.gprsinc.com)

Reviewed,



Ryan Shannon  
Area Manager—Denver



Direct: 303.913.8630  
ryan.shannon@gprsinc.com  
[www.gprsinc.com](http://www.gprsinc.com)

**ATTACHMENT D**  
**Laboratory Analytical Report**





April 25, 2023

Tait Environmental Services

Paul McCarter

6163 E. County Rd 16

Loveland CO 80537

Project Name - RFTA Glenwood Springs

Project Number - RFTA2022 PO#AS813

Attached are your analytical results for RFTA Glenwood Springs received by Origins Laboratory, Inc. April 13, 2023. This project is associated with Origins project number Y304288-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

## CROSS REFERENCE REPORT

| Sample ID | Laboratory ID | Matrix | Date Sampled         | Date Received    |
|-----------|---------------|--------|----------------------|------------------|
| B1-15     | Y304288-01    | Soil   | April 12, 2023 15:05 | 04/13/2023 11:30 |
| B1-25     | Y304288-02    | Soil   | April 12, 2023 15:15 | 04/13/2023 11:30 |
| B2-15     | Y304288-03    | Soil   | April 12, 2023 15:33 | 04/13/2023 11:30 |
| B2-25     | Y304288-04    | Soil   | April 12, 2023 15:40 | 04/13/2023 11:30 |
| B3-15     | Y304288-05    | Soil   | April 12, 2023 16:00 | 04/13/2023 11:30 |
| B3-22     | Y304288-06    | Soil   | April 12, 2023 16:10 | 04/13/2023 11:30 |
| B4-15     | Y304288-07    | Soil   | April 12, 2023 16:35 | 04/13/2023 11:30 |
| B4-25     | Y304288-08    | Soil   | April 12, 2023 16:40 | 04/13/2023 11:30 |

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**ORIGINS**  
LABORATORY, INC

Client: Tait Environmental Services

Address: 6163 E. County Rd. 16  
Loveland, CO 80537

Telephone Number: 714-719-6869

Email Address: p.mccarter@tait.com

www.originslaboratory.com

4304268

page of

Project Manager: Paul McCarter

Project Name: RFTA Glenwood Springs

Project Number: RFTA2022 PO#AS813

Samples Collected By: Paul McCarter

| Sample ID Description | Date Sampled | Time Sampled | # of Containers | Preservative |     |                  |       | Matrix      |      |                      | Analysis | Sample Instructions |
|-----------------------|--------------|--------------|-----------------|--------------|-----|------------------|-------|-------------|------|----------------------|----------|---------------------|
|                       |              |              |                 | Unpreserved  | HCl | HNO <sub>3</sub> | Other | Groundwater | Soil | Air Summa Canister # |          |                     |
| B1-15                 | 4-12-23      | 3:05 pm      |                 |              |     |                  |       |             |      |                      |          | 1 Analyze sample    |
| B1-25                 |              | 3:15 pm      |                 |              |     |                  |       |             |      |                      |          | 2 With highest      |
| B2-15                 |              | 3:33 pm      |                 |              |     |                  |       |             |      |                      |          | 3 TPH for PAH       |
| B2-25                 |              | 3:40 pm      |                 |              |     |                  |       |             |      |                      |          | 4 Using EPA 8210    |
| B3-15                 |              | 4:00 pm      |                 |              |     |                  |       |             |      |                      |          | 5                   |
| B3-22                 |              | 4:10 pm      |                 |              |     |                  |       |             |      |                      |          | 6                   |
| B4-15                 |              | 4:35 pm      |                 |              |     |                  |       |             |      |                      |          | 7                   |
| B4-25                 | 4-12-23      | 4:40 pm      |                 |              |     |                  |       |             |      |                      |          | 8                   |
|                       |              |              |                 |              |     |                  |       |             |      |                      |          | 9                   |
|                       |              |              |                 |              |     |                  |       |             |      |                      |          | 10                  |

Requisitioned By: [Signature]

Requisitioned By: [Signature]

Date: 4-13-23

Date: 4-13-23

Time: 11:30

Time: 11:30

Received By: [Signature]

Received By: [Signature]

Date: 4-13-23

Date: 4-13-23

Time: 180

Time: 180

Turnaround Time: Same Day ☐ 24 Hr ☐ 48 Hr ☐ 72 Hr ☐ Standard ☒

Temp Received: S

Date Results Needed

Origins Laboratory, Inc.

*Jefe Pellegrini*

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

Origins Laboratory

F-012207-01-R1  
Effective Date: 01/09/12

### Sample Receipt Checklist

Origins Work Order: 304288

Client: Tait Environ.

Client Project ID: RFTA Glenwood Springs

Checklist Completed by: JH/EMS

Shipped Via: TLN

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 4/13/23

Airbill #: na

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: \_\_\_\_\_

Cooler Number/Temperature: L15 °C / \_\_\_\_\_ °C / \_\_\_\_\_ °C (Describe)

Thermometer ID: 7004

| Requirement Description                                                                                                                                                                                                                                                                                                                                                                                             | Yes                                 | No                                  | N/A                      | Comments (if any) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------|
| If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| Is there ice present (document if blue ice is used)                                                                                                                                                                                                                                                                                                                                                                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)                                                                                                                                                                                                                                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                   |
| Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)                                                                                                                                                                                                                                                                                    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                   |
| Were all samples received intact <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| Was adequate sample volume provided <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                   |
| Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                                      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?                                                                                                                                                                                                                                                                                                                         | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |                   |
| For volatiles in water — is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.                                                                                                                                                                                                                                                                                                | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                   |
| Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) / (pH < 2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH > 10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH) | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                   |
| Additional Comments (if any):                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                     |                          |                   |

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date, time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 4/14/23

Origins Laboratory, Inc.

Jefe Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

B1-15

4/12/2023 3:05:00PM

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
Y304288-01 (Soil)

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 71.6 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 96.0 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 97.8 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 89.1 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**B1-25**

**4/12/2023 3:15:00PM**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
**Y304288-02 (Soil)**

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 72.0 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 95.9 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 98.8 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 90.5 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**B2-15**

**4/12/2023 3:33:00PM**

| Analyte | Result | Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
**Y304288-03 (Soil)**

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 72.1 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 95.2 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 96.8 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 89.6 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President



Tait Environmental Services  
6163 E. County Rd 16  
Loveland CO 80537

Paul McCarter  
Project Number: RFTA2022 PO#AS813  
Project: RFTA Glenwood Springs

**B2-25**

**4/12/2023 3:40:00PM**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
**Y304288-04 (Soil)**

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 73.9 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 95.2 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 97.5 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 90.4 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

B3-15

4/12/2023 4:00:00PM

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
Y304288-05 (Soil)

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 71.9 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 96.4 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 98.2 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 91.2 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**B3-22**

**4/12/2023 4:10:00PM**

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
**Y304288-06 (Soil)**

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 74.3 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 95.1 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 96.9 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 90.2 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services  
6163 E. County Rd 16  
Loveland CO 80537

Paul McCarter  
Project Number: RFTA2022 PO#AS813  
Project: RFTA Glenwood Springs

B4-15

4/12/2023 4:35:00PM

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
Y304288-07 (Soil)

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 74.2 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 97.0 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 97.5 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 88.0 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

B4-25

4/12/2023 4:40:00PM

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Analyst | Prepared | Analyzed | Notes |
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|
|---------|--------|-----------------|-------|----------|-------|---------|----------|----------|-------|

**Origins Laboratory, Inc.**  
Y304288-08 (Soil)

**BTEX-MTBE by EPA 8260D**

|                         |    |         |       |   |         |     |            |            |   |
|-------------------------|----|---------|-------|---|---------|-----|------------|------------|---|
| Benzene                 | ND | 0.00200 | mg/kg | 1 | B3D1433 | ZZZ | 04/14/2023 | 04/16/2023 | U |
| Toluene                 | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Ethylbenzene            | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Xylenes, total          | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |
| Methyl tert-Butyl Ether | ND | 0.00200 | "     | " | "       | ZZZ | "          | "          | U |

|                                  |        |        |   |   |   |
|----------------------------------|--------|--------|---|---|---|
| Surrogate: 1,2-Dichloroethane-d4 | 74.4 % | 70-130 | " | " | " |
| Surrogate: Toluene-d8            | 95.4 % | 70-130 | " | " | " |
| Surrogate: 4-Bromofluorobenzene  | 98.3 % | 70-130 | " | " | " |

**TPH-Carbon Chain by EPA 8015D**

|                                   |    |      |       |   |         |     |            |            |   |
|-----------------------------------|----|------|-------|---|---------|-----|------------|------------|---|
| Gasoline (C6-C10)                 | ND | 25.0 | mg/kg | 1 | B3D1424 | ZZZ | 04/14/2023 | 04/18/2023 | U |
| Diesel (C10-C28)                  | ND | 25.0 | "     | " | "       | ZZZ | "          | "          | U |
| Residual Range Organics (C28-C40) | ND | 100  | "     | " | "       | ZZZ | "          | "          | U |

|                        |        |        |   |   |   |
|------------------------|--------|--------|---|---|---|
| Surrogate: o-Terphenyl | 89.2 % | 50-150 | " | " | " |
|------------------------|--------|--------|---|---|---|

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

## Extractable Petroleum Hydrocarbons by 8015D - Quality Control

### Origins Laboratory, Inc.

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|

Batch B3D1424 - EPA 3550B

Blank (B3D1424-BLK1)

Prepared: 04/14/2023 Analyzed: 04/18/2023

|                                   |      |      |       |      |  |      |        |  |  |   |
|-----------------------------------|------|------|-------|------|--|------|--------|--|--|---|
| Gasoline (C6-C10)                 | ND   | 25.0 | mg/kg |      |  |      |        |  |  | U |
| Diesel (C10-C28)                  | ND   | 25.0 | "     |      |  |      |        |  |  | U |
| Residual Range Organics (C28-C40) | ND   | 100  | "     |      |  |      |        |  |  | U |
| Surrogate: o-Terphenyl            | 24.1 |      | "     | 24.9 |  | 96.7 | 50-150 |  |  |   |

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|

**Batch B3D1424 - EPA 3550B**

**LCS (B3D1424-BS1)**

Prepared: 04/14/2023 Analyzed: 04/18/2023

|                                   |      |      |       |      |  |      |        |  |  |  |
|-----------------------------------|------|------|-------|------|--|------|--------|--|--|--|
| Gasoline (C6-C10)                 | 884  | 50.0 | mg/kg | 1000 |  | 88.4 | 70-130 |  |  |  |
| Diesel (C10-C28)                  | 965  | 50.0 | "     | 1000 |  | 96.5 | 70-130 |  |  |  |
| Residual Range Organics (C28-C40) | 964  | 200  | "     | 1000 |  | 96.4 | 70-130 |  |  |  |
| Surrogate: o-Terphenyl            | 52.2 |      | "     | 49.8 |  | 105  | 50-150 |  |  |  |

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Jen Pellegrini For Noelle Doyle Mathis, President



Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|

**Batch B3D1424 - EPA 3550B**

|                                   |      |                           |       |      |                                           |      |        |  |  |  |
|-----------------------------------|------|---------------------------|-------|------|-------------------------------------------|------|--------|--|--|--|
| <b>Matrix Spike (B3D1424-MS1)</b> |      | <b>Source: Y304277-05</b> |       |      | Prepared: 04/14/2023 Analyzed: 04/18/2023 |      |        |  |  |  |
| Gasoline (C6-C10)                 | 936  | 50.0                      | mg/kg | 1000 | ND                                        | 93.6 | 70-130 |  |  |  |
| Diesel (C10-C28)                  | 1020 | 50.0                      | "     | 1000 | ND                                        | 102  | 70-130 |  |  |  |
| Residual Range Organics (C28-C40) | 1010 | 200                       | "     | 1000 | ND                                        | 101  | 70-130 |  |  |  |
| Surrogate: o-Terphenyl            | 45.6 |                           | "     | 49.8 |                                           | 91.6 | 50-150 |  |  |  |

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**Extractable Petroleum Hydrocarbons by 8015D - Quality Control**  
**Origins Laboratory, Inc.**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|

**Batch B3D1424 - EPA 3550B**

|                                        |      |                           |       |      |                                           |      |        |       |    |  |
|----------------------------------------|------|---------------------------|-------|------|-------------------------------------------|------|--------|-------|----|--|
| <b>Matrix Spike Dup (B3D1424-MSD1)</b> |      | <b>Source: Y304277-05</b> |       |      | Prepared: 04/14/2023 Analyzed: 04/18/2023 |      |        |       |    |  |
| Gasoline (C6-C10)                      | 931  | 50.0                      | mg/kg | 1000 | ND                                        | 93.1 | 70-130 | 0.472 | 35 |  |
| Diesel (C10-C28)                       | 1000 | 50.0                      | "     | 1000 | ND                                        | 100  | 70-130 | 2.12  | 35 |  |
| Residual Range Organics (C28-C40)      | 1000 | 200                       | "     | 1000 | ND                                        | 100  | 70-130 | 1.29  | 35 |  |
| Surrogate: o-Terphenyl                 | 52.1 |                           | "     | 49.8 |                                           | 105  | 50-150 |       |    |  |

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

## Extractable Petroleum Hydrocarbons by 8015D - Quality Control

### Origins Laboratory, Inc.

| Analyte                                | Result | Reporting Limit | Units | Spike Level | Source Result                             | %REC | %REC Limits | RPD | RPD Limit | Notes |
|----------------------------------------|--------|-----------------|-------|-------------|-------------------------------------------|------|-------------|-----|-----------|-------|
| <b>Batch B3D1433 - EPA 5030 (soil)</b> |        |                 |       |             |                                           |      |             |     |           |       |
| <b>Blank (B3D1433-BLK1)</b>            |        |                 |       |             | Prepared: 04/14/2023 Analyzed: 04/16/2023 |      |             |     |           |       |
| Benzene                                | ND     | 0.00200         | mg/kg |             |                                           |      |             |     |           | U     |
| Toluene                                | ND     | 0.00200         | "     |             |                                           |      |             |     |           | U     |
| Ethylbenzene                           | ND     | 0.00200         | "     |             |                                           |      |             |     |           | U     |
| Xylenes, total                         | ND     | 0.00200         | "     |             |                                           |      |             |     |           | U     |
| Methyl tert-Butyl Ether                | ND     | 0.00200         | "     |             |                                           |      |             |     |           | U     |
| Surrogate: 1,2-Dichloroethane-d4       | 0.084  |                 | "     | 0.125       |                                           | 67.3 | 70-130      |     |           | S-GC  |
| Surrogate: Toluene-d8                  | 0.12   |                 | "     | 0.125       |                                           | 96.7 | 70-130      |     |           |       |
| Surrogate: 4-Bromofluorobenzene        | 0.12   |                 | "     | 0.125       |                                           | 97.0 | 70-130      |     |           |       |

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services  
6163 E. County Rd 16  
Loveland CO 80537

Paul McCarter  
Project Number: RFTA2022 PO#AS813  
Project: RFTA Glenwood Springs

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

| Analyte                                | Result | Reporting Limit | Units | Spike Level | Source Result                             | %REC | %REC Limits | RPD | RPD Limit | Notes |
|----------------------------------------|--------|-----------------|-------|-------------|-------------------------------------------|------|-------------|-----|-----------|-------|
| <b>Batch B3D1433 - EPA 5030 (soil)</b> |        |                 |       |             |                                           |      |             |     |           |       |
| <b>LCS (B3D1433-BS1)</b>               |        |                 |       |             | Prepared: 04/14/2023 Analyzed: 04/16/2023 |      |             |     |           |       |
| Benzene                                | 0.0985 | 0.00200         | mg/kg | 0.100       |                                           | 98.5 | 70-130      |     |           |       |
| Toluene                                | 0.0988 | 0.00200         | "     | 0.100       |                                           | 98.8 | 70-130      |     |           |       |
| Ethylbenzene                           | 0.107  | 0.00200         | "     | 0.100       |                                           | 107  | 70-130      |     |           |       |
| m,p-Xylene                             | 0.230  | 0.00400         | "     | 0.200       |                                           | 115  | 70-130      |     |           |       |
| o-Xylene                               | 0.114  | 0.00200         | "     | 0.100       |                                           | 114  | 70-130      |     |           |       |
| Methyl tert-Butyl Ether                | 0.102  | 0.00200         | "     | 0.100       |                                           | 102  | 70-130      |     |           |       |
| Surrogate: 1,2-Dichloroethane-d4       | 0.083  |                 | "     | 0.125       |                                           | 66.4 | 70-130      |     |           | S-GC  |
| Surrogate: Toluene-d8                  | 0.12   |                 | "     | 0.125       |                                           | 98.2 | 70-130      |     |           |       |
| Surrogate: 4-Bromofluorobenzene        | 0.12   |                 | "     | 0.125       |                                           | 97.6 | 70-130      |     |           |       |

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
|---------|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|

**Batch B3D1433 - EPA 5030 (soil)**

| Matrix Spike (B3D1433-MS1)       |       | Source: Y304288-01 |       |       | Prepared: 04/14/2023 Analyzed: 04/16/2023 |      |        |  |  |      |
|----------------------------------|-------|--------------------|-------|-------|-------------------------------------------|------|--------|--|--|------|
| Benzene                          | 0.101 | 0.00200            | mg/kg | 0.100 | 0.00196                                   | 99.4 | 70-130 |  |  |      |
| Toluene                          | 0.101 | 0.00200            | "     | 0.100 | ND                                        | 101  | 70-130 |  |  |      |
| Ethylbenzene                     | 0.113 | 0.00200            | "     | 0.100 | ND                                        | 113  | 70-130 |  |  |      |
| m,p-Xylene                       | 0.244 | 0.00400            | "     | 0.200 | ND                                        | 122  | 70-130 |  |  |      |
| o-Xylene                         | 0.122 | 0.00200            | "     | 0.100 | ND                                        | 122  | 70-130 |  |  |      |
| Methyl tert-Butyl Ether          | 0.102 | 0.00200            | "     | 0.100 | ND                                        | 102  | 70-130 |  |  |      |
| Surrogate: 1,2-Dichloroethane-d4 | 0.084 |                    | "     | 0.125 |                                           | 67.0 | 70-130 |  |  | S-GC |
| Surrogate: Toluene-d8            | 0.12  |                    | "     | 0.125 |                                           | 97.3 | 70-130 |  |  |      |
| Surrogate: 4-Bromofluorobenzene  | 0.13  |                    | "     | 0.125 |                                           | 100  | 70-130 |  |  |      |

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

**Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control**  
**Origins Laboratory, Inc.**

| Analyte                                | Result | Reporting Limit | Units | Spike Level | Source Result             | %REC | %REC Limits | RPD  | RPD Limit | Notes                                     |
|----------------------------------------|--------|-----------------|-------|-------------|---------------------------|------|-------------|------|-----------|-------------------------------------------|
| <b>Batch B3D1433 - EPA 5030 (soil)</b> |        |                 |       |             |                           |      |             |      |           |                                           |
| <b>Matrix Spike Dup (B3D1433-MSD1)</b> |        |                 |       |             |                           |      |             |      |           |                                           |
|                                        |        |                 |       |             | <b>Source: Y304288-01</b> |      |             |      |           |                                           |
|                                        |        |                 |       |             |                           |      |             |      |           | Prepared: 04/14/2023 Analyzed: 04/16/2023 |
| Benzene                                | 0.0914 | 0.00200         | mg/kg | 0.100       | 0.00196                   | 89.4 | 70-130      | 10.3 | 20        |                                           |
| Toluene                                | 0.0909 | 0.00200         | "     | 0.100       | ND                        | 90.9 | 70-130      | 10.3 | 20        |                                           |
| Ethylbenzene                           | 0.0965 | 0.00200         | "     | 0.100       | ND                        | 96.5 | 70-130      | 16.2 | 20        |                                           |
| m,p-Xylene                             | 0.208  | 0.00400         | "     | 0.200       | ND                        | 104  | 70-130      | 16.1 | 20        |                                           |
| o-Xylene                               | 0.105  | 0.00200         | "     | 0.100       | ND                        | 105  | 70-130      | 15.2 | 20        |                                           |
| Methyl tert-Butyl Ether                | 0.0961 | 0.00200         | "     | 0.100       | ND                        | 96.1 | 70-130      | 6.39 | 20        |                                           |
| Surrogate: 1,2-Dichloroethane-d4       | 0.085  |                 | "     | 0.125       |                           | 67.7 | 70-130      |      |           | S-GC                                      |
| Surrogate: Toluene-d8                  | 0.12   |                 | "     | 0.125       |                           | 97.5 | 70-130      |      |           |                                           |
| Surrogate: 4-Bromofluorobenzene        | 0.12   |                 | "     | 0.125       |                           | 97.1 | 70-130      |      |           |                                           |

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Tait Environmental Services

6163 E. County Rd 16

Loveland CO 80537

Paul McCarter

Project Number: RFTA2022 PO#AS813

Project: RFTA Glenwood Springs

### Notes and Definitions

U Sample is Non-Detect.

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President



**ATTACHMENT E**  
**Non-hazardous Waste Manifest**



## NON-HAZARDOUS WASTE MANIFEST

48490

Please print or type.

|                                                                                                                                                                            |                                                                                                                                   |               |                                                                                   |                           |                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------|---------------------------|-----------------|
| GENERATOR                                                                                                                                                                  | 3. Generator's Name and Mailing Address<br>GLENWOOD SPRINGS MAINTENANCE FACILITY                                                  |               | 5. Generating Location (if different)<br>2307 WULFSOHN ROAD, GLENWOOD SPRINGS, CO |                           |                 |
|                                                                                                                                                                            | 4. Phone ( ) 2307 WULFSOHN RD. GLENWOOD SPRINGS, CO                                                                               |               | 6. Phone ( )                                                                      |                           |                 |
|                                                                                                                                                                            | 7. Transporter #1 Company Name<br>VISTA GEOSCIENCE                                                                                |               | 9. Transporter #1's Phone<br>(303) 277 1694                                       |                           |                 |
|                                                                                                                                                                            | 10. Transporter #2 Company Name                                                                                                   |               | 12. Transporter #2's Phone                                                        |                           |                 |
|                                                                                                                                                                            | 13. Designated T/S/D Facility Name and Site Address<br>RARITAN CWT<br>2695 S. Raritan Street<br>Englewood, CO 80110               |               | 15. Facility's Phone<br>(303) 991-6002                                            |                           |                 |
|                                                                                                                                                                            | 16. Waste Shipping Name and Description                                                                                           |               | 18. Containers                                                                    | 19. Total Quantity        | 20. Unit Wt/Vol |
|                                                                                                                                                                            | a. Non U.S. EPA or DOT regulated contaminated water/gasoline mix                                                                  |               | No.                                                                               | Type                      | Gallons         |
|                                                                                                                                                                            | b. Non U.S. EPA or DOT regulated contaminated water/diesel mix                                                                    |               |                                                                                   |                           | Gallons         |
|                                                                                                                                                                            | c. Petroleum Contaminated Soil/Slurry                                                                                             |               |                                                                                   |                           | CYS             |
|                                                                                                                                                                            | d. POT HOLE SLURRY                                                                                                                |               |                                                                                   | 150                       | gallons         |
| 21. Additional Descriptions for Materials Listed Above<br>For Beneficial Reuse/Recycling                                                                                   |                                                                                                                                   |               |                                                                                   |                           |                 |
| 22. Special Handling Instructions and Additional Information                                                                                                               |                                                                                                                                   |               |                                                                                   |                           |                 |
| 23. GENERATOR'S CERTIFICATION: I certify the materials described on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste. |                                                                                                                                   |               |                                                                                   |                           |                 |
| Printed/Typed Name<br>Dustin Goodman                                                                                                                                       |                                                                                                                                   | Signature<br> |                                                                                   | Month Day Year<br>4 17 23 |                 |
| TRANSPORTER                                                                                                                                                                | 24. Transporter #1: Acknowledgement of Receipt of Materials                                                                       |               |                                                                                   |                           |                 |
|                                                                                                                                                                            | Printed/Typed Name<br>David Fontana                                                                                               |               | Signature<br>                                                                     |                           |                 |
|                                                                                                                                                                            | 25. Transporter #2: Acknowledgement of Receipt of Materials                                                                       |               | Month Day Year<br>4 14 23                                                         |                           |                 |
|                                                                                                                                                                            | Printed/Typed Name                                                                                                                |               | Signature                                                                         |                           |                 |
| T/S/D FACILITY                                                                                                                                                             | 26. Discrepancy Indication Space                                                                                                  |               |                                                                                   |                           |                 |
|                                                                                                                                                                            | 27. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest (except as noted in Item 19) |               |                                                                                   |                           |                 |
| Printed/Typed Name                                                                                                                                                         |                                                                                                                                   | Signature     |                                                                                   | Month Day Year            |                 |

NHWM 08/15

ORIGINAL - RETURN TO GENERATOR

To order more forms call: 480-804-7328



October 11, 2023

VIA EMAIL: [mhermes@rfta.com](mailto:mhermes@rfta.com)

Mike Hermes  
Roaring Fork Transportation Authority  
1340 Main Street  
Carbondale, CO 81623

Re: No Further Action (NFA) Determination for Roaring Fork Transit Agency, 2307 Wulfsohn Road, Glenwood Springs, Garfield County, Colorado. (Event ID 17254, Release ID 16242, Facility ID 15558)

Dear Mike Hermes:

The Division of Oil and Public Safety (OPS) has reviewed the Site Characterization Report (SCR) NFA request (RR-088835) for the referenced site received on April 26, 2023.

Based solely upon the information submitted, OPS will require no further action at this time. If conditions change, OPS reserves the right to determine if any additional actions are necessary. This NFA letter is in reference to a confirmed release reported on November 2, 2022.

Please submit a [Site Decommissioning Report](#) to OPS to document well abandonment and site decommissioning activities within 90 days of receiving this NFA Determination. **OPS cannot release you from any liability that may be associated with any contamination at or from this site.**

Please address correspondence regarding this site to me and if you have any questions, please contact me at 720-376-0239 or via email at [Hannah.williams@state.co.us](mailto:Hannah.williams@state.co.us).

Sincerely,

*K. Hannah Williams*

K. Hannah Williams  
Environmental Protection Specialist  
Petroleum Program

cc: Dustin Goodman, Roaring Fork Transportation Authority, [dgoodman@rfta.com](mailto:dgoodman@rfta.com)  
Ben Ludlow, Roaring Fork Transportation Authority, [bludlow@rfta.com](mailto:bludlow@rfta.com)  
Billy Bob Bates, Tait Environmental Services, Inc., [bbbates@tait.com](mailto:bbbates@tait.com)  
Paul McCarter, OPS REP, Tait Environmental Services, Inc., [pmccarter@tait.com](mailto:pmccarter@tait.com)



Layers

Search by Attribute

Search by Location

Other

☒

DNR Well Application Permits

⋮

Augmentation

Commercial

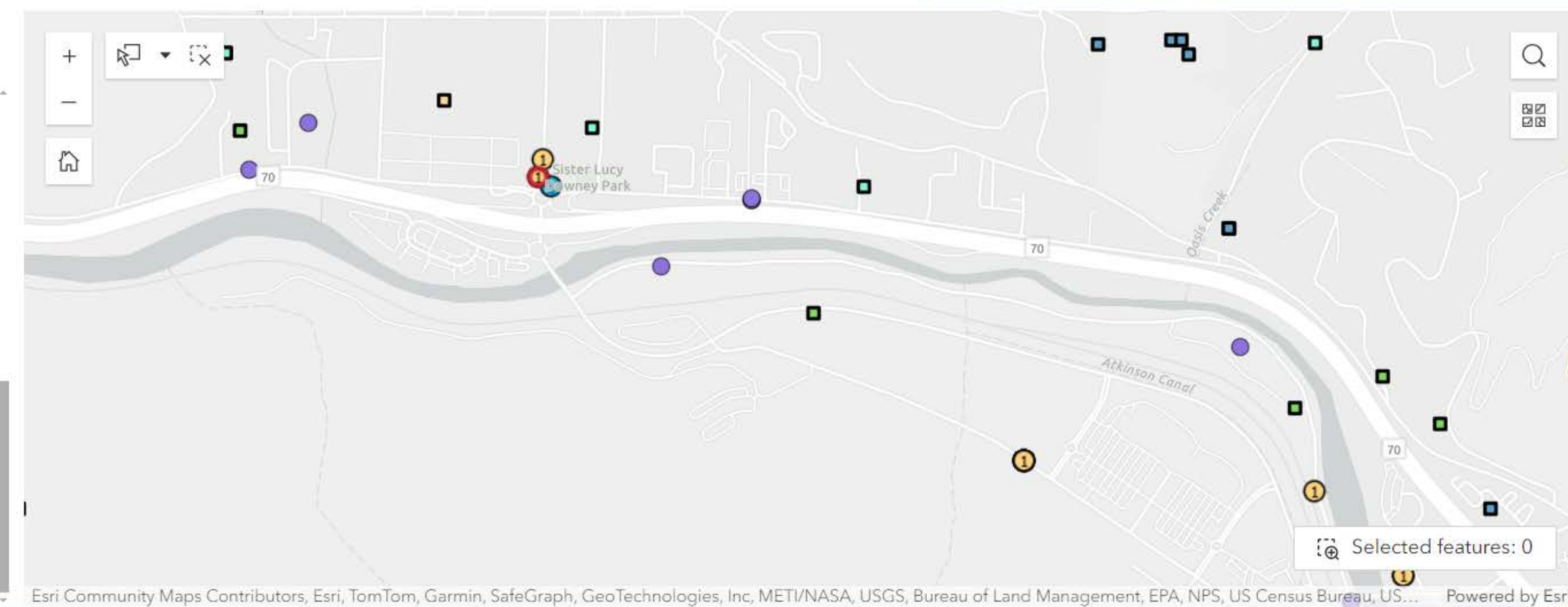
Domestic

Fire

Industrial

Irrigation

Municipal



OPS Events (Map)

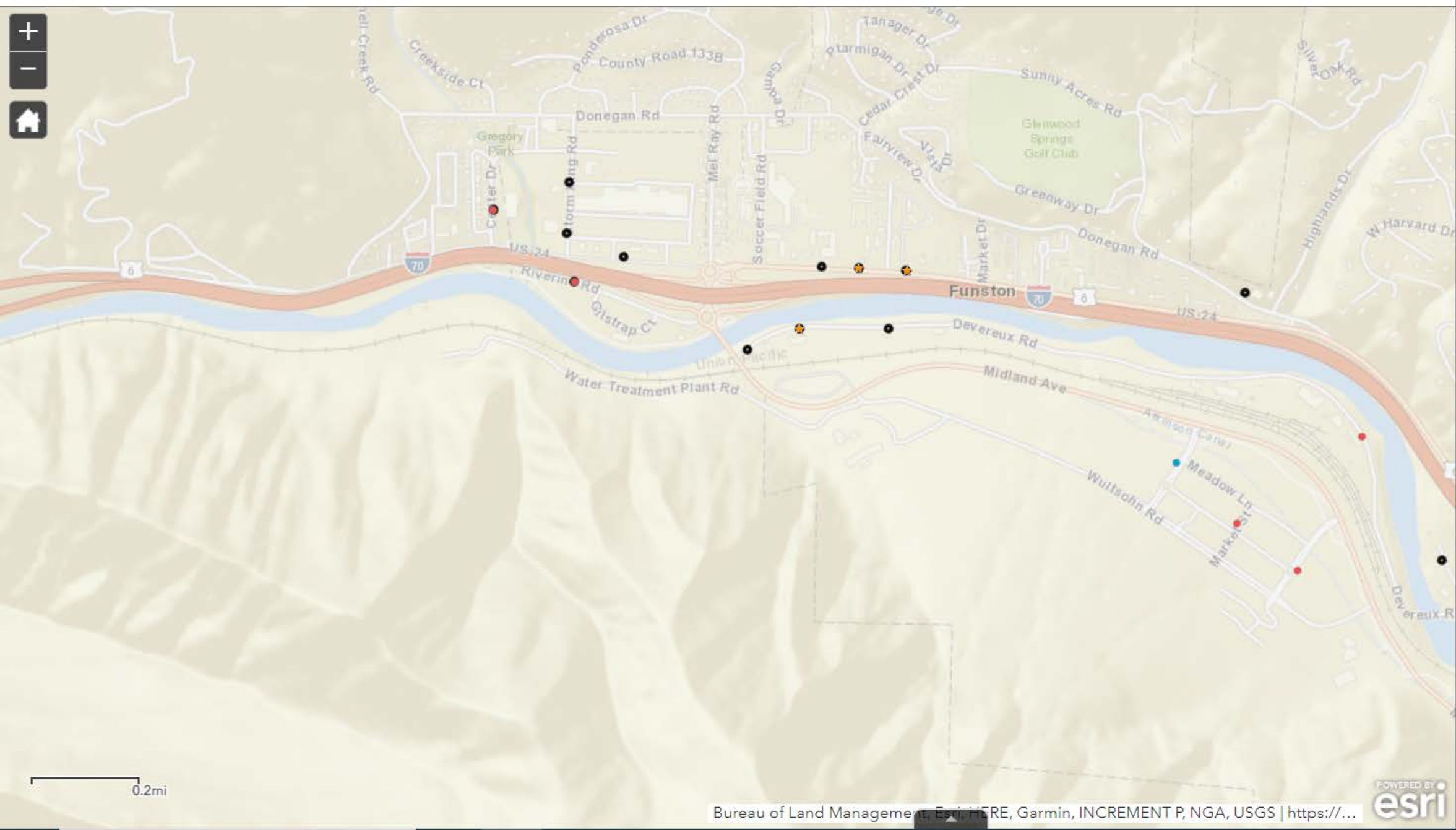
DNR Well Application Permits

All OPS Events - CIM

| Event ID | Facility ID | Release Number | Release Record Type | Status | No Further Action (...) | Site Name                    | Contact Name   |
|----------|-------------|----------------|---------------------|--------|-------------------------|------------------------------|----------------|
| 14,149   | 11,578      | REL-015867     | Confirmed           | Closed | Tier I                  | King Soopers Fuel Center ... | Tom Fox        |
| 17,370   | 21,003      | REL-016379     | Site Assessment     | Closed | Tier I                  | Former Texaco Gas Station    | Kyle Campb...  |
| 17,358   | 20,986      | REL-016364     | Site Assessment     | Closed | Tier I                  | Former Cheapies              | Michelle Ho... |



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### Sites legend

**Layers**

- ☒ Institutional controls
- ☒ Voluntary Cleanup and Redevelopment Program (VCUP)
- ☒ RCRA corrective action
- ☒ RCRA active handler
- ☒ Federal facilities
- ☒ Superfund / National Priorities List (NPL NRD)
- ☒ Brownfields
- ☒ Solid waste facilities
- ☒ Petroleum release events
- ☒ Waste tire haulers
- ☒ Waste tire registrants
- ☒ Uranium Mill Tailings (UMTRA)
- ☒ Counties
- ☒ May 2023 DI Communities
- ☐ Prior DI Community



Navigation

Home Identify Pan Zoom In Zoom Out Initial View Previous Extent Next Extent Bookmarks

Sharing

Export Upload Data Add Layers Layer Catalog Share Print

Layers

- ☐ Structure (Admin/Decreed)
- ☐ Structure (Points of Interest)
- ☒ Well Application
  - ☒ All Well Applications
  - ☒ Well Constructed
  - ☒ Permit Issued
  - ☒ Well Abandoned
  - ☒ OGCC Well
- ☐ Final Permit
- ☐ Ground Water
- ☐ Surface Water Current Conditions

Quick Tools

Topogra...

UTM Zone 13, NAD83

X 298054.29717  
Y 4381001.10796

Packet Page 1757,028

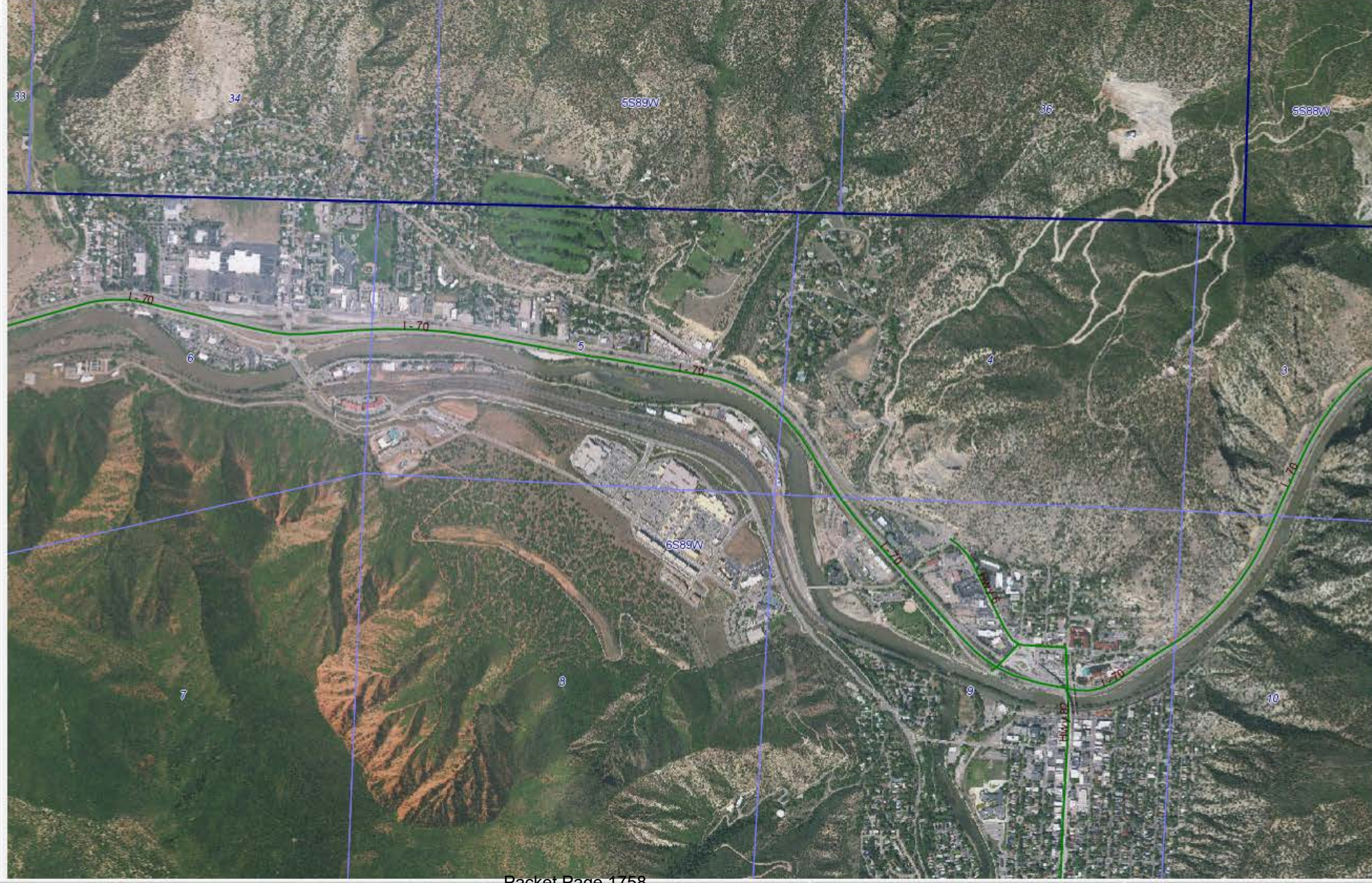
0 300 600ft

Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/N





- Layers
- ☒ Facilities
    - ☐ Directional Wellbores
    - ☐ Flowlines Fluid Type (APPROVED)
  - ☒ COGCC
    - ☐ Staff Contacts (Mouseover For Flyout)
    - ☒ Environmental
    - ☐ Oil & Gas Fields
    - ☐ Orders
    - ☒ Projects Rulison & Rio Blanco
    - ☒ Rules
    - ☐ Seismic Permits
    - ☐ Orphaned Well Program
    - ☒ Other Projects
  - ☐ Historic Wells
  - ☒ Roads & Railroads (CDOT)
  - ☒ Water Resources (DWR & CDPHE)
  - ☐ Floodplains (FEMA)
  - ☐ Environmental Sites
  - ☐ Air Quality (CDPHE)
  - ☒ Section, Township, & Range (PLSS)
  - ☐ Local Government Designees (LGDs)
  - ☒ Parks & Wildlife (CPW)
  - ☐ National Wetlands Inventory (USFWS)
  - ☒ State Land (SLB)
  - ☒ Tribal Lands
  - ☒ Federal Land (BLM)
  - ☒ Surface Features
    - ☐ Places
    - ☐ Parcels
    - ☐ Airports
    - ☐ School Districts
    - ☒ Surface Owner
      - ☐ Cities
      - ☐ Counties
    - ☐ Soil Survey (NRCS)
  - ☐ Mining
  - ☒ Geology
  - ☒ Topography
  - ☒ Aerial Imagery
    - ☐ 1990s (Black & White) Image Dates
    - ☐ 1990s (Black & White)
    - ☐ 2009 (NAIP)
    - ☐ 2011 (NAIP)
    - ☐ 2013 (NAIP)
    - ☐ 2015 (NAIP)
    - ☐ 2017 (NAIP)
    - ☐ 2019 (NAIP)
    - ☒ 2021 (NAIP)



  
**COLORADO**  
Energy & Carbon  
Management Commission  
Department of Natural Resources

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Please contact:  
  
David Gates  
david.gates@state.co.us  
(303) 894-2100

**NOTE** - Many tablet and smart-phone browsers will not work with our interactive map. If you are having problems on a mobile device, please try using a computer-based browser instead.



**From:** [MaryLynn Stevens](#)  
**To:** [Jacob King](#)  
**Cc:** [Jill Cantway](#)  
**Subject:** RE: Website inquiry - Open Records Request  
**Date:** Thursday, June 13, 2024 2:27:10 PM

---

**CAUTION** This email originated from outside our organization. Do not click links or open attachments unless you recognize the sender and verify the email address matches their name.

Mr. King,

I am in receipt of your request set forth below. Garfield County does not have any responsive records on the properties. You may want to contact the City of Glenwood Springs to see if they have any records on the properties.

This request is closed.

Mary Lynn Stevens  
Paralegal/Off. Mgr  
Garfield County Attorney's Office

---

**From:** noreply@formstack.com <noreply@formstack.com>  
**Sent:** Tuesday, June 11, 2024 1:39 PM  
**To:** MaryLynn Stevens <mlstevens@garfield-county.com>; Jan Shute <jshute@garfield-county.com>; Jill Cantway <jcantway@garfield-county.com>  
**Subject:** Website inquiry - Open Records Request



Date: 6/11/2024

Requestor's name: Jacob King

Organization represented (if any): ERO Resources Corporation

Address: 1626 Cole Blvd  
Suite 100  
Lakewood, CO 80401

Email: [jking@eroresources.com](mailto:jking@eroresources.com)

Phone number: (970) 818-1181

Fax:

Name of document(s) requested, including the department where the document(s) originated: ERO Resources Corporation is conducting an Initial Site Assessment (ISA) for the Roaring Fork Transportation Authority Glenwood Maintenance Facility project, located at 2307 Wulfsohn Road, Glenwood Springs, CO. ERO is requesting records for the following Garfield County parcels: 218505336002, 218505337001, and 218505337003.

A georectified PDF map of the project area or a KMZ will be provided upon request.

As part of this ISA, ERO is requesting a search of department records for the project area that may indicate a release or disposal of petroleum products or hazardous materials. Examples of such sites include underground and/or aboveground storage tanks, incidents involving hazardous substances or petroleum products spills, use or storage, landfills, or reports of illegal solid waste disposal, enforcement actions, complaints or inspection notices.

If you have any questions, please feel free to reach out via my email or cell phone at any time.

Thank you,  
Jacob King

**From:** [Ryan M. Muse](#)  
**To:** [Jacob King](#)  
**Cc:** [Ryan M. Muse](#); [Steve Boyd](#); [Danyelle Rigli](#)  
**Subject:** CORA Request Fulfilled  
**Date:** Thursday, June 13, 2024 5:38:34 PM  
**Attachments:** [image001.png](#)  
[Glenwood Springs Fire CORA request.pdf](#)  
[14-1309.pdf](#)  
[21-879.pdf](#)  
[22-332.pdf](#)  
[22-1050.pdf](#)  
[22-1540.pdf](#)

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**CAUTION** This email originated from outside our organization. Do not click links or open attachments unless you recognize the sender and verify the email address matches their name.

Good afternoon, Jacob,

Attached are all the documents related to your CORA request.

Take care,

**Ryan Muse**

City Clerk

City of Glenwood Springs

970-384-6406

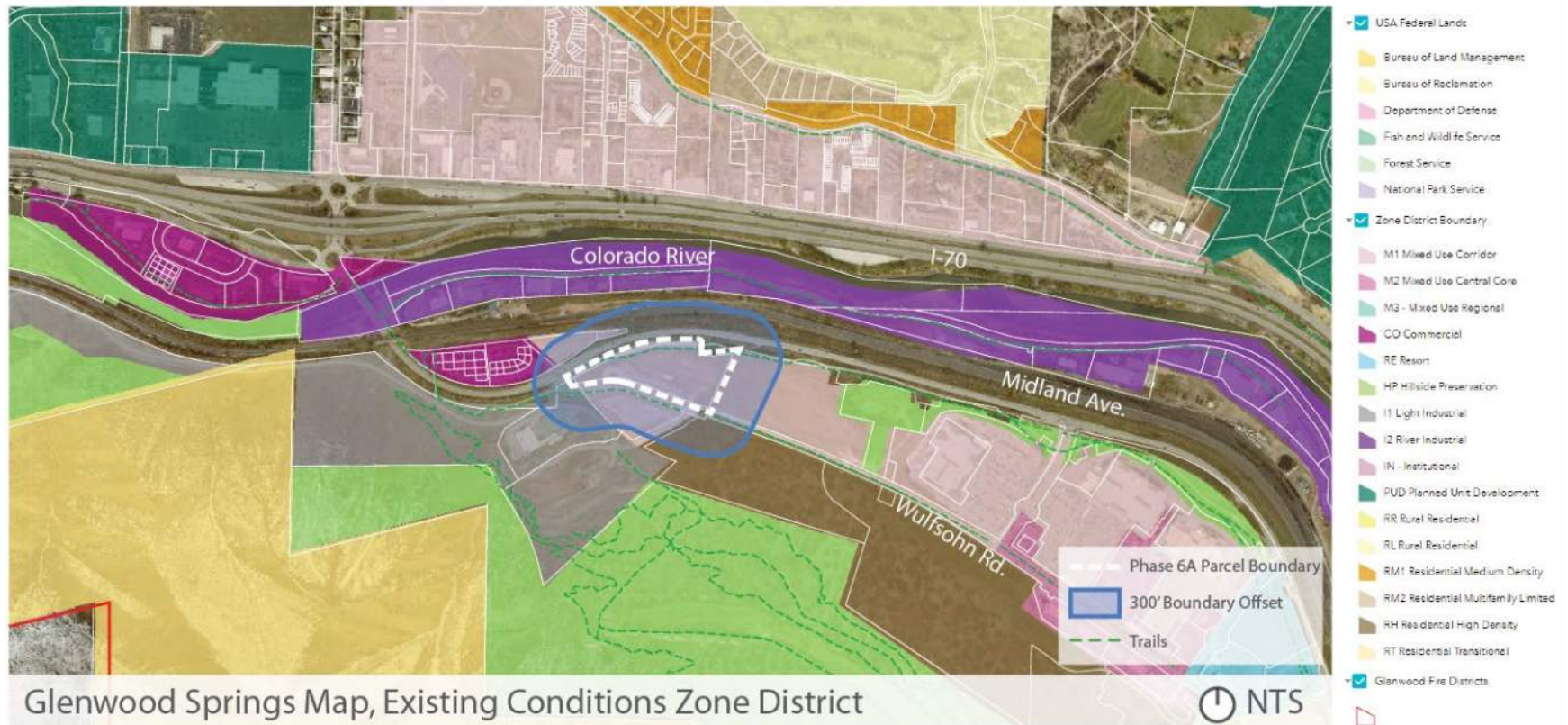
[www.cogs.us](http://www.cogs.us)

[\\*Accessibility Policy / Póliza de accesibilidad\\*](#)



## **Appendix L: List of Property Owners within 300 feet**

## Appendix L: List of Property Owners within 300 feet



| Parcel Number | Account Number | Address                                          | Owner Name                            | Owner Address                                     |
|---------------|----------------|--------------------------------------------------|---------------------------------------|---------------------------------------------------|
| 218505338014  | R041501        | Not available                                    | CENTURA VENTURES LLC                  | 9100 E MINERAL CIRCLE ENGLEWOOD, CO 80112         |
| 218505337003  | R041405        | Not available                                    | ROARING FORK TRANSPORTATION AUTHORITY | 0766 INDUSTRY WAY CARBONDALE, CO 81623            |
| 218508143001  | R084916        | Not available                                    | GLENWOOD MEADOWS, LLC                 | 710 E DURANT AVENUE, SUITE W6 ASPEN, CO 81611     |
| 218505336004  | R084509        | Not available                                    | ROARING FORK TRANSPORTATION AUTHORITY | 2307 WULFSOHN ROAD GLENWOOD SPRINGS, CO 81601     |
| 218505336002  | R009167        | 2307 WULFSOHN RD<br>GLENWOOD SPRINGS CO<br>81601 | ROARING FORK TRANSPORTATION AUTHORITY | 1340 MAIN STREET CARBONDALE, CO 81623             |
| 218505336003  | R009168        | Not available                                    | GLENWOOD SPRINGS, CITY OF             | 101 W 8TH STREET GLENWOOD SPRINGS, CO 81601       |
| 218505335004  | R009105        | Not available                                    | GLENWOOD SPRINGS, CITY OF             | 101 W 8TH STREET GLENWOOD SPRINGS, CO 81601       |
| 218505335003  | R009104        | 130 MIDLAND AVE<br>GLENWOOD SPRINGS CO<br>81601  | INTEGRATED MOUNTAIN GROUP INC         | 1001 GRAND AVENUE #201 GLENWOOD SPRINGS, CO 81601 |



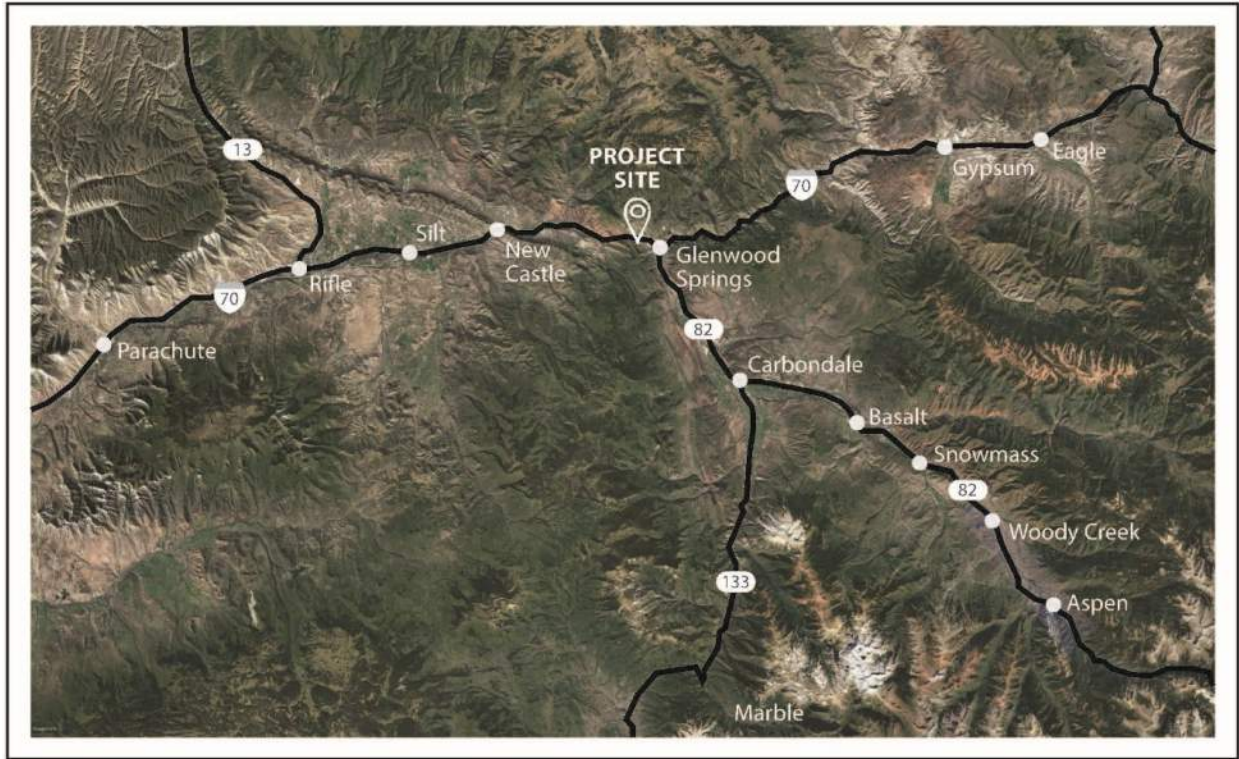


# **RFTA West Glenwood Transit Center (Phase 6A)**

**Land Use Application: Matters of State Interest Permit**

Glenwood Springs, CO

September 2024



VICINITY MAP

NTS

**Prepared for:**

City of Glenwood Springs

101 W 8th St.

Glenwood Springs, CO 81601

**Prepared by:**

DHM Design

225 Main St. #201

Carbondale, CO 81623



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### Matters of State Interest Permit

#### *Transit center – Phase 6A*

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# Introduction

The Roaring Fork Transportation Authority (RFTA) is proposing to develop a West Glenwood Transit Center (Phase 6A), Administration Building (Phase 6B) and a maintenance building (Phase 8). The proposed projects are designated for three distinct parcels as shown on the project context map on page 2. RFTA currently owns all three parcels. Phase 6A is a proposal to upgrade the existing West Glenwood park-and-ride into a regional transit center. Phase 6B is a proposal to construct an administration building for RFTA professional staff. Phase 8 is a proposal to construct an additional maintenance building at the existing RFTA General Maintenance Facility. A complete description of each Phase is provided in this document.

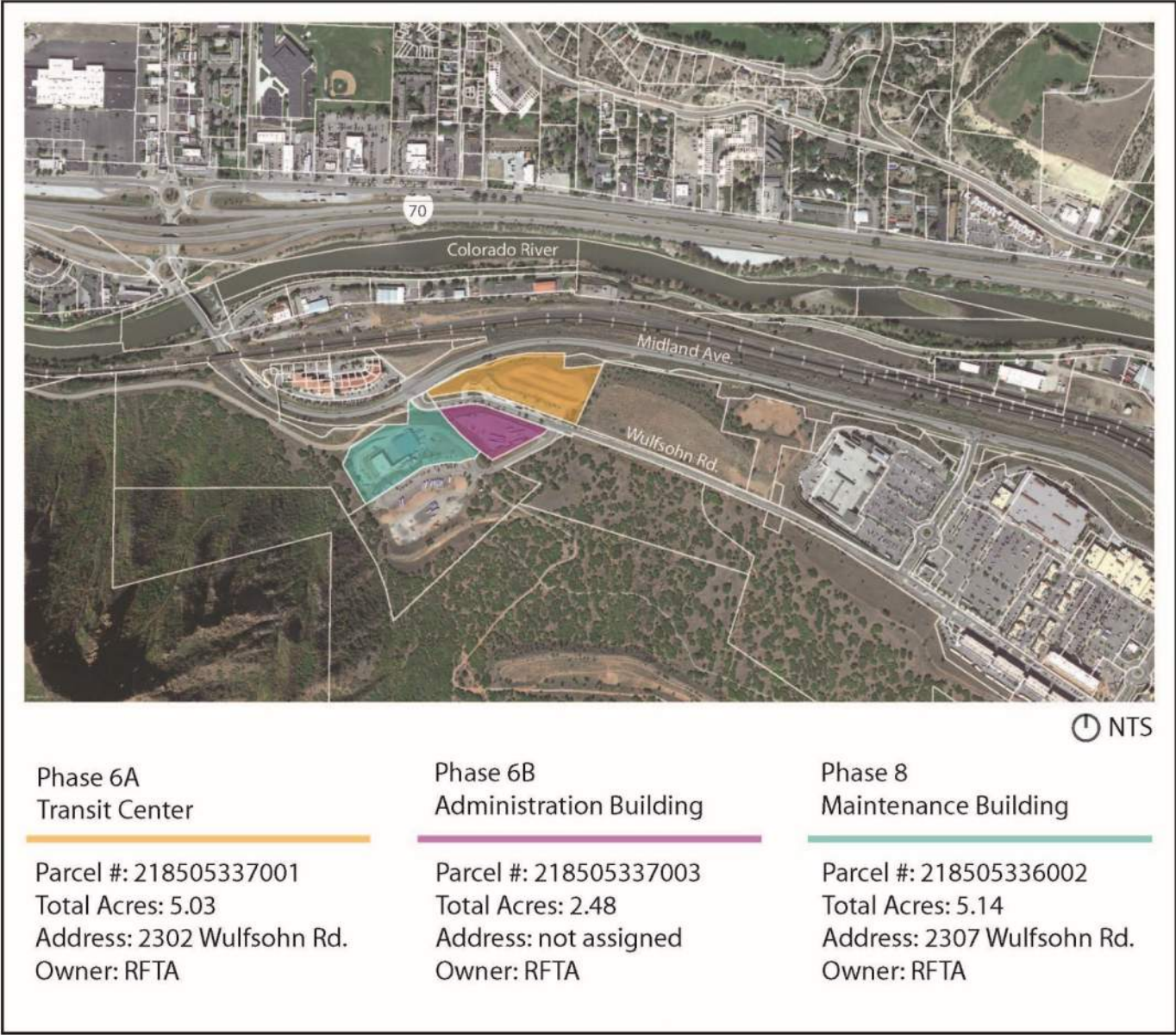
Per the City of Glenwood Springs Municipal Code, the Phase 6A Transit Center is subject to review under Article 070.080 Matters of State Interest. All Phases are subject to review under Article 070.60.050(d) Location and Extent Review. This document, along with the design plans and appendices, encompasses the application for a Matters of State Interest permit.

## **Matters of State Interest - Development Code Article 070.080**

The purpose of the Matters of State Interest process is, in part, to regulate site selection of mass transit stations to ensure that they avoid conflicts with the City's land use plans. The following materials submitted under this category demonstrate the proposed development is consistent with the guidelines established in the City's Comprehensive Plan and the statutory requirements and criteria set forth in C.R.S. § 24-65.1-101 et seq.

This document encompasses the Matters of State Interest permit application for Phase 6A, the proposed Transit Center. As noted above, the Phase 6B Administration Building and Phase 8 Maintenance Building are not subject to the State Interest review and are therefore omitted from this section.

# Project Site Context Map



**Note:** Parcel acreage and information listed here is per Garfield County Assessor database and may vary from surveyed conditions.

# Project Narrative

## Background

The Roaring Fork Transportation Authority (RFTA) has been operating in the Roaring Fork Valley since 1983. RFTA provides a variety of public transportation services along the State Highway 82 corridor (Glenwood Springs to Aspen) and along a segment of I-70 (Glenwood Springs to Rifle). Formerly, RFTA was exclusively dedicated to regional transit. Today, RFTA has a role in express and local regional transit, senior/para-transit, bus rapid transit, multi-modal infrastructure, first-and-last mile mobility, and public skier shuttle services. It is the second largest transit system in Colorado and the largest rural transit system in the United States, providing nearly 5 million trips annually with a fleet of over 100 buses.

Currently, RFTA provides transit services spanning 3 counties and 70 linear miles, from Aspen to Rifle. Since 2004, RFTA ridership has grown by 60% and is estimated to increase by at least 25% over the next 20 years, under the most conservative scenarios. To meet the emerging transportation needs, RFTA is expanding services along the I-70 corridor between Glenwood Springs and Parachute.

## The Need

Transportation is a component of the built environment and the term “public transportation” includes a wide variety of services that provide regimented and continuous transportation means to the public. Historically, transportation policies and infrastructure investments have emphasized and prioritized road improvements over supporting public transportation systems and facilities. Shifting the focus onto expanding public transportation facilities can increase the use of public transit and simultaneously reduce traffic congestion and air pollution. Additionally, increased access to public transportation can also improve health equity by providing the opportunity to access vital services, employment, and providing a foundation for social connection.<sup>1</sup>

The Roaring Fork Valley is a rapidly growing region with RFTA as a vital connector for the growing workforce and residential communities. In fact, Garfield County demographics data shows that the County will experience continuous growth over the next 25 years with the population expected to grow by more than 50% in the next 30 years.<sup>2</sup> To accommodate this continuous population growth and the changing environmental climate, RFTA developed a plan for the future of public transportation operations throughout the region.

In 2016, RFTA began to take a closer look at regional transit needs referencing the Integrated Transportation System Plan (ITSP) and the Upper Valley Mobility Study (UVMS). In 2018, RFTA developed a strategic improvement plan for the region’s transportation system titled Destination 2040.

Destination 2040 includes project goals and measurable milestones focusing on improvements for the environment, solutions for reducing traffic congestion and improving mobility, and improvements in sustainability and safety. These identified deliverables are specific to the Roaring Fork Valley. The Destination 2040 project will ultimately help RFTA maintain and improve its services, infrastructure and equipment.<sup>3</sup>

As part of these efforts and in response to regional population growth and increasing transit demand, RFTA has identified the need to develop a Regional Transit Center in West Glenwood Springs. The Regional Transit Center (RTC) project includes three phases: Phase 6A Transit Center, Phase 6B Administration Building, and Phase 8, Maintenance Building.

Phase 6A entails upgrading the existing West Glenwood Park & Ride to make it a true transit center with an expanded bus platform, transit building, bathrooms, and various user amenities.

## References

<sup>1</sup> "Public Transportation In The US: A Driver Of Health And Equity," Health Affairs Health Policy Brief, July 29, 2021. <https://www.healthaffairs.org/doi/10.1377/hpb20210630.810356/>

<sup>2</sup> "Continued Growth in Garfield County." Garfield County Demographics – Economic Development. [www.garfield-county.com/economic-development/garfield-county-demographics/](http://www.garfield-county.com/economic-development/garfield-county-demographics/)

<sup>3</sup> Roaring Fork Transportation Authority. "Destination 2040 Roadmap." RFTA. [www.rfta.com/2040roadmap/](http://www.rfta.com/2040roadmap/). Accessed 9 Jan. 2024

# Project Overview

## Context

The RFTA Phase 6A transit center is proposed for a site on Wulfsohn road in west Glenwood Springs where there is currently a park and ride bus station, see context map on page 2.

The transit center will be a main node for the RFTA system in the Roaring Fork Valley, cultivating connections between neighboring towns. The transit center will be the link between the Highway 82 corridor and the I-70 corridor “Hogback” routes. The center will provide amenities such as indoor waiting areas to foster comfortable and seamless connections between these two major transportation corridors as well as first-and-last mile connections to nearby multi-family residential and commercial areas. The site design emphasizes and respects the existing views and is thoughtfully designed to be a bright and welcoming public space.

The administration building is expected to be the face of RFTA and is therefore a critical component of RFTA's vision for the next 20 years and beyond.

## Architectural and Site Design

The style of architecture reflects other RFTA projects in the valley. At the transit center, the roof forms echo those used at the existing BRT stations at 27th Street and up valley. The materials are reflective of the mountain environment and history, with stone, wood and metal elements. The administration building materially connects with the transit center by using similar materials and tones. The Phase 8 maintenance building is intended to be aesthetically similar to the existing GMF building. There will be no public access to this building.

The program for the transit center building includes a portion that is limited for RFTA employees and operations programming on the west side with separate commuter-friendly programming on the east side of the building. The transit center includes programming including but not limited to a driver lounge, ticketing station, public restrooms, lost & found, and mechanical and maintenance storage areas. The proposed project includes an improved ADA parking area and additional parking downslope.

## Infrastructure (Roads, Trails, and Utilities)

The park & ride expansion has been designed to prioritize safety and accessibility. The bus platform maximizes space for bus bays while also activating points of access and que areas with raised planting areas. Pedestrian safety signage and a crosswalk is proposed to connect sidewalks along south Wulfsohn with the transit center. The paved path on the north side of Wulfsohn connects directly to the platform. The transit platform has been designed in a way that trail users will be able to safely connect between the north and south segments of the trail using the proposed crosswalk. Reference the Traffic Study summary included on page for more information regarding the proposed crosswalk and pedestrian signage.

All needed utilities are in place, no major extensions are anticipated beyond what would typically be needed for any construction project. Electrical, water, sewer, gas, telephone, and cable, already exist within the project area; these utilities will be adapted and re-aligned as necessary to meet project needs.

## Landscape & Green Space

The transit center is designed with raised planters throughout the platform to shape and guide a thoughtful circulation experience around the space. Waiting riders are provided various covered and uncovered seating areas with opportunities for social interaction or quiet space. The plant palette emphasizes native and drought tolerant species to be used throughout the project. The landscaping reflects the character and context of the surrounding landscape found along the edges and surrounding the development.

The landscape at the administration building echoes that found at the transit center by using similar elements, such as raised planters at the building entry, covered outside seating, and a similar native and drought tolerant plant pallet. Also included is outdoor gathering and meeting room spill over space, amphitheater seating, and an informal walking path with bench seating.

### **Plan Set**

The Phase 6A Transit Center architectural and engineering plan set submitted separately is intended to be reviewed alongside this document and the appendices. The plan set includes architectural, civil engineering, lighting, and landscape drawings.



## Ownership

RFTA (Roaring Fork Transportation Authority)  
2307 Wulfsohn Road  
Glenwood Spring, CO 81601

## Project Team:

### Architect

Short Elliot Hendrickson Inc.  
2000 S Colorado Blvd (Tower 1, Suite 6000)  
Denver, CO 80222  
Phone: (720)540-6812  
Email: [ajauch@sehinc.com](mailto:ajauch@sehinc.com)  
Contact: Alex Jauch

### Civil Engineer

Short Elliot Hendrickson Inc.  
2000 S Colorado Blvd (Tower 1, Suite 6000)  
Denver, CO 80222  
Email: [tneutzel@sehinc.com](mailto:tneutzel@sehinc.com)  
Contact: Tim Nuetzel

### Landscape Architect

DHM Design Corporation  
225 Main Street, Suite 201  
Carbondale, CO 81623  
Phone: (970)963-6520  
Email: [jjaynes@dhmdesign.com](mailto:jjaynes@dhmdesign.com)  
Contact: Jason Jaynes

### Electrical

CMO Consulting Engineers, LLC  
11646 Sun Bear Trl  
Golden, Colorado 80403

# Land Use Application From



## LAND USE APPLICATION

City of Glenwood Springs  
Economic and Community Development Dept.  
101 West 8<sup>th</sup> Street  
Glenwood Springs, CO 81601  
970-384-8411

| Ordinance Amendments                                                 |  | Development Permits                                        |  |
|----------------------------------------------------------------------|--|------------------------------------------------------------|--|
| <input type="checkbox"/> Rezoning                                    |  | <input type="checkbox"/> Site/Architectural Plan Review    |  |
| <input type="checkbox"/> Rezoning to Planned Unit Development (PUD)  |  | <input type="checkbox"/> Administrative                    |  |
| <input type="checkbox"/> Annexation                                  |  | <input type="checkbox"/> Minor                             |  |
| <input type="checkbox"/> Condominiumization                          |  | <input type="checkbox"/> Major                             |  |
| <input type="checkbox"/> Annexation                                  |  | <input type="checkbox"/> Master Plan                       |  |
| <input type="checkbox"/> Street Vacation                             |  | <input type="checkbox"/> Construction Plans                |  |
|                                                                      |  | <input type="checkbox"/> Location & Extent                 |  |
| Subdivisions                                                         |  | <input type="checkbox"/> Right of Way Encroachment License |  |
| <input type="checkbox"/> Minor Subdivision                           |  | <input type="checkbox"/> Floodplain Development Permit     |  |
| <input type="checkbox"/> Preliminary Plat                            |  | <input type="checkbox"/> Special Use Permit                |  |
| <input type="checkbox"/> Final Plat                                  |  | Flexibility and Relief Procedures                          |  |
| <input type="checkbox"/> Vacation of Right-of-Way                    |  | <input type="checkbox"/> Variance                          |  |
|                                                                      |  | <input type="checkbox"/> Administrative Adjustment         |  |
| Other Land Use Applications                                          |  | <input type="checkbox"/> Appeal                            |  |
| <input type="checkbox"/> Outdoor Seating                             |  |                                                            |  |
| <input checked="" type="checkbox"/> Matters of State Interest (1041) |  |                                                            |  |

| Applicant/Property Owner Information: |                                    |                                              |                                |
|---------------------------------------|------------------------------------|----------------------------------------------|--------------------------------|
| Applicant                             |                                    | Owner                                        |                                |
| DHM Design Corporation                |                                    |                                              |                                |
| Relationship to Owner                 |                                    | Owner                                        |                                |
| Subconsultant                         |                                    | Roaring Fork Transportation Authority (RFTA) |                                |
| Applicant Address                     |                                    | Owner Address                                |                                |
| 225 Main St. #201                     | Carbondale, CO 81623               | 2307 Wurtsohn Road                           | Glenwood Springs, CO 81601     |
| Phone 970/963-6520                    | Email Address jaynes@dhmdesign.com | Phone 970.384.4858                           | Email Address bludlow@rfta.com |

| Property Information:                  |                                                                          |
|----------------------------------------|--------------------------------------------------------------------------|
| Address                                | Parcel Number                                                            |
| See Project Site Context Map on page 5 | (Phase 6A) 218505337001, (Phase 6B) 218505337003, (Phase 8) 218505336002 |
| Subdivision                            | Lot and Block Number                                                     |
|                                        |                                                                          |
| Zone District Mixed-Use Corridor (M1)  | Existing Land Use                                                        |

| General Project Description:                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Development of existing RFTA property to improve the community transit and RFTA staff experience by providing a new (9) bay transit center, new regional consolidated administration building, and storage building for RFTA bus maintenance staff. |

| Signatures:                                                                                                                                                                                                                                                                                                                                |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| The owner or applicant must be present at the hearing. All public hearings must be properly noticed according to G.S.M.C. Section 070.010.030. Signatures of all owners of the property must appear before the application is accepted. Partnerships or corporations may have the authorized general partner or corporate officer sign the |      |
| Applicant                                                                                                                                                                                                                                                                                                                                  | Date |
| Owner                                                                                                                                                                                                                                                                                                                                      | Date |

# Matters of State Interest Permit

## Article 070.80 Guidelines and Regulations for Matters of State Interest

*The purpose and intent of the regulations set forth in Article 070.80 is to facilitate the identification, designation, and administration of matters of state interest consistent with the statutory requirements and criteria set forth in Section 24-65.1-101, et seq., C.R.S., and the guidelines established in the Comprehensive Plan, as well as the following [partial]:*

*(3) To regulate the site selection of rapid or mass transit terminals, stations, and fixed guideways to ensure that the same are located in a manner that will avoid conflicts with the City’s land use plans; minimize congestion in the streets; secure safety from fire, floodwaters, and other dangers; promote health and general welfare; provide adequate light and air; prevent the overcrowding of land; avoid undue concentration of population; and facilitate the adequate provision of transportation, water, sewerage, schools, parks, and other public requirements;*

### Conformance with the Comprehensive Plan

In the following section, pertinent language from the Comprehensive Plan is provided, with an Applicant response at the end.

Goals [partial]:

Address transportation needs and provide multiple convenient travel choices

Action Plan [partial]:

| Land Use & Future Growth |                                                                                                                                                |                                       |           |               |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------|---------------|
| #                        | Policy/Action                                                                                                                                  | Champion                              | Timeline  | High Priority |
| 1.1                      | Promote Transit Oriented Development (TOD).                                                                                                    |                                       |           |               |
| 1.1.A                    | Plan for transit stations located in all mixed-use neighborhoods by incorporating principles of smart growth, new urbanism and green building. | Engineering/RFTA                      | Near Term |               |
| 1.1.B                    | Concentrate growth in Glenwood Springs in locations that can be served by high-frequency transit.                                              | Engineering and Community Development | Near Term |               |

### Land Use and Growth Management Strategies:

*“The City and the Roaring Fork Transportation Authority (RFTA) should continue to promote redevelopment and the expansion of transit infrastructure to enhance the regional bus service...” pg. 44*

*Community Character & Vitality:*

*“Glenwood Meadows has seen recent residential and commercial development, with multi-family housing and both small and large-scale retail and restaurants. Glenwood Meadows is also anchored by the Glenwood Springs Community Center. With easy access to*

*Downtown and commercial uses, the vision for the remainder of buildable land in Glenwood Meadows is mixed-use development to increase housing options in this transit-served area.” pg. 53*

*Transportation and Mobility:*

*“Investment in transit to improve options to travel within, to and through Glenwood Springs is also a priority.” pg. 66*

*“A major barrier that has been identified by RFTA and the City is that the BRT does not regularly serve downtown or West Glenwood... This has restricted the ability of transit to effectively serve commuters traveling through Glenwood, residents from most of the neighborhoods in Glenwood who commute up-valley, or relieve traffic congestion on CO 82 through town.” pg. 68*

*“A core strategy to mitigate future traffic growth on CO 82 in Glenwood Springs will be to improve regional transit to and through Glenwood Springs.” pg. 71*

*“It is recommended to work with RFTA to improve the VelociRFTA bus rapid transit (BRT) through Glenwood Springs, including prioritizing bus movement, and increasing frequency to Downtown and West Glenwood... This would improve options for two of the three dominant regional travel markets during peak times on CO 82, including commuters from Western Garfield County traveling through Glenwood Springs to the Roaring Fork Valley, and commuters from Glenwood Springs commuting up-valley. Eventually extending the BRT west of Glenwood Springs could further meet demand for the inbound and pass-through travel market originating in Western Garfield County.” pg. 71*

*“Additionally, improving the frequency, reliability and speed of transit service along the Hogback route west of Glenwood Springs both to and within Glenwood Springs would also improve options for the inbound commuter travel market from western Garfield County.” pg. 71*

**RESPONSE:**

The Comprehensive Plan identifies several deficiencies in the existing public transportation system which the proposed transit center is designed to address.

One of the identified deficiencies is the absence of BRT connectivity to West Glenwood and the convenience of bus services along the Hogback route west of Glenwood Springs. Both of these issues are directly addressed by the proposed improvements to the existing West Glenwood Park & Ride. The new transit center will allow expansion of BRT to West Glenwood and also provide convenient connectivity to bus services to New Castle and Rifle. The Comp Plan states that in order to reduce traffic on Highway 82 through Glenwood Springs, convenient public transit needs to be available to pass-through commuters coming from western Garfield County. The West Glenwood Springs transit center will enable RFTA to provide these services.

The Comprehensive plan identifies the Glenwood Meadows area as a location for future mixed-use development along an existing transit corridor. There are currently several mixed-use apartment buildings in Glenwood Meadows and additional apartments are under construction. As shown on the Zone District Map on page 31, the property immediately east of the proposed station is zoned for mixed use development and the property directly across Wulfsohn Road is zoned for high density residential development. Locating a transit station near this existing and future development furthers the transit and land-use goals of the Comprehensive Plan.

The proposed improvements to the existing West Glenwood Park & Ride will provide a more comfortable station with expanded service area, which will make public transit a more attractive option to both local and regional residents.

The Comprehensive Plan generally supports expansion of public transportation services and specifically encourages improvements to services in West Glenwood and beyond. The transit center project is in keeping with and furthers these goals.

## **070.80.250 Submission Requirements for all Permit Applications; Waivers**

*The Applicant is providing the following responses to specific Sections of the Code as requested by the City of Glenwood Springs Planning Department. The Planning Department did not request responses to certain Sections of the Code and these Sections have been omitted as noted.*

### **(a) Cover Page**

*Completed application cover page in the format approved and maintained by the Community Development Department.*

Please see the completed cover page form on page 8, at the beginning of this document.

### **(b) Information Describing the Applicant.**

#### **1. The names, addresses, including email address and fax number, organizational form, and business of the applicant and, if different, the owner of the project.**

Ben Ludlow, Capital Projects Program Manager, bludlow@rfta.com, 970.384.4858

The Roaring Fork Transportation Authority has been in operation since 1983, and functions as a Regional Transportation Authority (RTA). The RTA includes the communities of Aspen, Snowmass Village, Pitkin County, Basalt, and a portion of Eagle County, Carbondale, Glenwood Springs and the newest member New Castle. RFTA provides commuter bus service from Aspen to Glenwood Springs (Roaring Fork Valley), Glenwood to Rifle (Hogback), intra city service in Aspen and Glenwood Springs, ski shuttle service to the four Aspen Skiing Company ski areas, the Maroon Bells Shuttles, and a variety of other seasonal services.

#### **2. The names, addresses and qualifications, including those areas of expertise and experience with projects directly related or similar to that proposed in the application package, of individuals who are or will be responsible for constructing and operating the project.**

See table on page 12 for a list of those who are responsible for the constructing and operation of the project and their previous experience with similar project types or expertise.

#### **3. Written authorization of the application package by the project owner, if different than the applicant.**

See written authorization in Appendix F provided by the project owner.

**4. Documentation of the applicant's financial and technical capability to develop and operate the project, including a description of the applicant's experience developing and operating similar projects.**

Not requested, not provided.

**5. Written qualifications of report preparers.**

Not requested, not provided.

The qualifications of those responsible for the construction and operation of this facility are provided in the table below.

| NAME            | ADDRESS                                                                         | QUALIFICATIONS                        |
|-----------------|---------------------------------------------------------------------------------|---------------------------------------|
| Ben Ludlow      | <a href="mailto:bludlow@rfta.com">bludlow@rfta.com</a> , 970.384.4858           | RFTA Capital Projects Program Manager |
| Kyle Eckes      | <a href="mailto:keckes@rfta.com">keckes@rfta.com</a> , 970.618.1733             | RFTA Capital Projects Project Manager |
| Alex Jauch      | <a href="mailto:ajauch@sehinc.com">ajauch@sehinc.com</a> , 720.540.6812         | SEH Project Manager                   |
| Chuck Gustafson | <a href="mailto:cgustafson@sehinc.com">cgustafson@sehinc.com</a> , 719.248.3249 | SHE Construction Manager              |

**(c) Information Describing the Project Proposal.**

**1. A description of the proposed facilities and site.**

See Project Narrative which outlines the proposed project.

**2. A description of other present or most recent use and zoning.**

The project site is currently being used as the West Glenwood Park & Ride. The current zone district for this project parcel is M1, Mixed Use Corridor. See zone district map on page 22 for the zoning for the project site and adjacent parcels. Article 070.020 in the Glenwood Springs Municipal Code outlines each zone district and Table 070.030.020.1 outlines the allowed uses for each zone district. The COGS Planning Department has determined that a separate Special Use Permit is not required for this project.

**3. Vicinity map showing the proposed site, including proposed zoning designation, and the surrounding area.**

Please see page 22 showing the proposed site and zoning designation in relationship to the surrounding area.

**4. Executive summary of the proposal indicating the scope and need for the project.**

A summary of the project scope and associated need is provided on page 5 in this application.

**5. Plans and specifications of the project in sufficient detail to evaluate the application against the applicable review criteria.**

A complete plan set including a site plan, grading plan, utility plan, architectural plans, landscape plans and lighting plans is provided in conjunction with this document.

**6. Descriptions of alternatives to the project considered by the applicant. If the Community Development Director determines that the nature or extent of the proposal involves the potential**

***for significant damage and warrants examination of other specific, less damaging alternatives, the Community Development Director may require the applicant to evaluate and present information on such additional alternatives as part of the application.***

Not requested, not provided.

***7. Schedules for designing, permitting, constructing and operating the project, including the estimated life of the project.***

Construction is anticipated to begin on 2/2/25, pending approval of land use application. The project is expected to be completed in 9/30/26. See Appendix E for a more detailed project schedule that includes expected dates and deadlines throughout the estimated life of the project.

***8. The need for the project, including a discussion of alternatives to the project that were considered and rejected; existing/proposed facilities that perform the same or related function; and population projections or growth trends that form the basis of demand projections justifying the project.***

The project is needed to accommodate the ridership increase at the West Glenwood Park and ride. This ridership increase has caused a demand for climate controlled waiting space and bike parking. In addition, since the addition of Bustang at this location, there are multiple time during the day that many transit users are left outside waiting for their bus to arrive with no shelter from weather elements. Since this site is already an existing facility, the need to upgrade at this site makes the most sense. There are no other sites within the RFTA network that can be used as this currently is. This site is also important to transit users due to the close proximity to Interstate 70.

***9. Description of relevant conservation techniques to be used in the construction and operation of the project.***

Architectural and Building Strategies:

The design team has focused on minimizing major impacts to the existing site by focusing building placement at or near existing grades and utilizing the existing topography to reduce major cut and fill. Pre-cast construction is also being utilized to assist in the construction timeline reduce construction waste. Geothermal is being introduced into 6A to help offset energy costs.

Landscape Strategies:

The landscape plant palette focuses on native and drought tolerant plants. RFTA has committed to minimizing or eliminating permanent outside water use and irrigation for this project. The landscaping will be similar in appearance to the existing dryland landscape at the west-most intersection of Midland Avenue and Wulfsohn Road. This planting includes native sagebrush, rabbit brush, Rocky Mountain juniper, one-seed juniper, pinon pine, and ponderosa pine. Non-native deciduous trees will be used where shade is desired as there are very few deciduous trees native to Colorado suitable to use for this purpose. There will also be areas of non-native ornamental shrubs and grasses. The proposed non-native trees, shrubs, and grasses are adapted to and aesthetically compatible with the dryland conditions.



**10. Description of demands that this project expects to meet and basis for projections of that demand.**

This proposed project will meet the emerging transportation needs throughout the rapidly growing region. To accommodate the continuously growing population, the improvements and expansion to this transit station will ensure that regimented and continuous transportation services will be available to the public and transit users.

**11. List of adjacent property owners and their mailing addresses.**

See page 22 for a list of all adjacent parcel owners and their mailing addresses (if available) within 300' of the Phase 6A proposed development. The zone district map on page 22 illustrates the extents of 300' from the Phase 6A parcel boundary and shows which adjacent parcel owners are included in the list.

**(d) Scope of Proposed Project Relevant to Specific Designated Area and/or Activity.**

**1. Domestic water or sewage treatment systems and/or major extensions thereof.**

***a. Detailed plans of the proposal, including not less than thirty (30) percent engineering plans and specifications prepared by a registered professional engineer, and proposed system capacity and service area plans mapped at a scale acceptable to the Department.***

Not requested, not provided.

***b. A description of all existing or approved proposed domestic water or sewage treatment systems within the proposed project area.***

Not requested, not provided.

***c. A description of the design capacity of each domestic water or sewage treatment system facility proposed and the distribution or collection network proposed in the proposed project area.***

Not requested, not provided.

***d. A description of the excess capacity of each treatment system and distribution or collection network in the affected community or proposed project area.***

Not requested, not provided.

***e. A description of the operational efficiency of each existing system in the proposed project area, including the age, state of repair, and level of treatment.***

Not requested, not provided.

***f. A description of the existing water utilization, including the historic yield from rights and use by category such as agricultural, municipal, and industrial supply obligations to other systems.***

Not requested, not provided.

***g. A description of any impacts to the City's water resources used to serve the City's water service area.***

The expansion of the Transit center will result in an increase in impervious area. The additional impervious area will increase runoff from the site and the potential for sediment and pollutants to be carried in this runoff. The civil engineer's grading design captures runoff where feasible and diverts the runoff to water quality and detention facilities. These facilities will mitigate the sediment and pollutants in the runoff. The outlet structures of the facilities will restrict flows in the major and minor storms to be released at preconstruction rates to minimize adverse impacts on adjacent and downstream drainageways and properties.

A proposed underground storage facility within the lower parking lot shall be used for water quality and detention. Flows will be routed to the facility through proposed inlets and storm sewers. Flows will be released at historic rates to the north.

## **2. Major facilities of a public utility.**

### ***a. Specifications of approximate floor space of any office building, storage facility, or other enclosed structure.***

At the transit center, there is the proposed transit building that is one story and 3,232 gross square feet. The plan also has an enclosed bike storage facility and shade structures on the platform. See the architectural plans submitted separately for more detailed information regarding interior programming and associated square footages for the transit center building (Phase 6A).

RFTA is also proposing an administration office building on a separate parcel on the south side of Wulfsohn road, (Phase 6B) that is 10,820 gross square feet. The administration building is not subject to the Matters of State Interest review and is not a part of this application.

### ***b. Voltage and length of transmission lines.***

Not requested, not provided.

### ***c. The power source and generating capacity.***

Not requested, not provided.

### ***d. The function and size of any substation.***

Not requested, not provided.

### ***e. The diameter and length of any gas pipeline.***

Not requested, not provided.

### ***f. The capacity of storage tanks, and type of petroleum derivative to be stored.***

Not requested, not provided.

### ***g. The proposed service area.***

Not requested, not provided.

### ***h. The resource area (e.g. source of power being generated or transmitted, source of petroleum derivative being transported).***

Not requested, not provided.

***i. A computer modeled electromagnetic field measurement within the proposed transmission line easement for that portion of the transmission line between substations or transition sites.***

Not requested, not provided.

***j. Measures taken to comply with the concept of prudent avoidance with respect to planning, siting, construction, and operation of transmission lines, which may be those steps taken to comply with CCR 723-3 § 3206(9)(b) or similar authority, for projects where other similar authority is applicable.***

Not requested, not provided.

***k. Any impacts to vegetation and wildlife in the City.***

The project site is not an undeveloped parcel. There is currently a park-and-ride lot and bus station on this parcel and the proposed project includes improvements to this developed area so there is expected to be minimal impacts to native vegetation or contiguous wildlife habitat. Existing trees and native vegetation will be preserved to the highest extent possible. Revegetation and additional plant material is specified as needed to meet the requirement of 15% landscaped area on the parcel, to comply with the municipal code. See the landscape plan within the 50% DD plan set submitted separately for more information regarding limits of disturbance, revegetation areas, and proposed planting for the proposed project.

***l. Possible alternatives to underground transmission lines associated with the facility.***

Not requested, not provided.

***m. Visuals demonstrating impact to scenic resources.***

The project site is surrounded by existing and future development. The existing adjacent development includes the RFTA General Maintenance Facility and bus storage. Zoning for future development includes high density residential housing to the south of the project and mixed use to the east. The proposed development will be consistent in scale and appearance with the surrounding development context and will not be visually out of place to the casual observer. The materials proposed for the project will reflect those seen around Glenwood Springs downtown core and the design of the building is similar to others developed around the city so the building design and materials contribute visually to the sense of place. The ridgeline of Red Mountain is approximately 1500 vertical feet above the project site and the project will not impact the ridgeline.

Additionally, the Historical Resources review notes that the proposed project does not impact any historic visual resources.

### ***3. Efficient utilization of municipal and industrial water projects.***

***a. A description of efficient water use, recycling and reuse technology intended for the project. Such description shall include estimated stream transit losses of water, reservoir evaporation losses, and power and energy requirements of the project and project alternatives.***

Not requested, not provided.

***b. Map and description of other municipal and industrial water projects in the City and vicinity, including capacity and service levels, location of intake and discharge points, debt structure, fees and rates, and service plan boundaries.***

Not requested, not provided.

***c. A description of the water to be used, including the applicant's right to use the water, adjudicated decrees or determinations, quantity, and comments from reviewing authorities.***

Not requested, not provided.

***4. Development in areas containing, or having a significant impact upon, historical, natural, or archaeological resources of statewide importance.***

***a. A description of the existing natural environment and an analysis of the impacts of the project on the natural environment and natural resources, including water resources, wildlife, and air quality, to include maps and engineering analyses regarding the surface water quality, groundwater quality, water quantity, flood lands, wetlands, and riparian areas.***

As stated previously, the project site is not undisturbed, but is rather currently developed as a park-and-ride and transit station. A majority of the proposed development occurs within these disturbed areas. The provided Historic Resources review, Archaeological Resources review, and the Biological Resources review do not list any anticipated significant impacts due to this project.

***b. A description of proposals to mitigate any impact to the natural environment and natural resources, including to the watershed, wildlife, or air quality.***

The proposed development is not anticipated to have any major impacts to the surrounding environment due to the fact that the parcel is already developed. However, landscaping is proposed throughout the project to minimize the impact of the proposed site walls and improved transit center building. Drought tolerant and native plant species shall be proposed to promote local wildlife and blend into the natural environment. The Biological Resources review contains recommendations for construction to reduce impacts on wildlife.

***3. A description of the existing historical and archaeological resources in the proposed project area and a description of proposals to mitigate any impact to the existing historical and archaeological resources.***

The provided Archaeological Resources review finds no archaeological resources have been previously documented in the file search area. The provided Historical Resource review recommends a determination of "no adverse effect" pursuant to 36 CFR 800.5 of the NHPA. See Appendix G

***5. Development in areas around key facilities in which development may have a material effect upon the key facility or the surrounding community.***

***a. A description of the existing key facilities and an analysis of the impacts of the project on the key facilities and the surrounding community to include maps showing the key facilities and including traffic and use studies.***

Traffic study has been provided by RFTA/SGM. SEH's team has reviewed the provided traffic study and has worked with RFTA to provide the recommended turn lanes along Wulfshon. See attached civil plans for more detail and placement of these lanes.

***b. A description of proposals to mitigate the impact on the key facilities and surrounding communities.***

Per the COGS City Planner, RFTA will be subject to fees for a new lift station per the cost sharing agreement that applied to land within the Glenwood Meadows Subdivision parcels.

**(e) Proof of Notice. As provided under Section 070.080.280.**

Applicant shall mail noticing per 070.080.280. See neighboring property owner list, pg.22

**(f) Comments of Other Agencies. Any commentary received by other agencies with review authority over the proposal, including, without limitation, the state Department of Natural Resources, the state Department of Public Health and Environment, and any other federal, state, or local agency.**

The project is federally funded and is under direct observation of CDOT Region 3, who is administering a portion of the federal funding. Final approval will need to be received by CDOT prior to construction.

**(g) Demonstration of Need.**

***1. Population trends for the project area, including present population, population growth, and growth rates document the sources used.***

According to US Census Bureau data, the current population in Glenwood Springs is estimated at 10,264 as of July 1, 2022. The original transit stop was built in 2005 when the population in Glenwood Springs was significantly lower. Improving the transit station is necessary to support the expansion of RFTA services along the I-70 corridor. The location of this transit station is a central hub connecting communities west of I-70 (Parachute, Rifle, and New Castle) with resources up valley such as Glenwood Springs and Aspen. According to a transportation consultant that analyzed traffic patterns in this community, Fehr and Peer, "60% of inbound commuting trips to Glenwood Springs were from Rifle and New Castle".

Regarding future population growth, Garfield County reports that the County will experience continuous growth with the population expected to grow by more than 50% in the next 30 years.

***2. The predominant types of developments to be served by the proposed new systems and/or facilities or extensions thereof.***

Not requested, not provided.

***3. The percentage of design capacity at which the current system is now operating.***

Not requested, not provided.

***4. A description of conditions and projections that prohibit present facilities from being upgraded to adequately accommodate increased demand.***

This project entails updating an existing park-and-ride and transit stop for greater functionality as ridership increases.

### **5. Potential alternatives.**

Please see the introduction narrative for an overview of the need for the project and projected growth of ridership to be served by the project. There are no known viable alternative sites for this project.

### **(h) Property Rights, Other Permits, and Approvals.**

#### **1. Description of property rights that are necessary for or that will be affected by the project, including easements and property rights proposed to be acquired through negotiation or condemnation.**

RFTA currently owns the parcel proposed for development. All existing easements will remain.

#### **2. A list of all other federal, state, and local permits and approvals that will be required for the project, together with any proposal for coordinating these approvals with the City permitting process. Copies of any permits or approvals related to the project that have been granted.**

| JURISDICTION                     | TITLE                                   | CAUSE                                                                              | STATUTORY REFERENCE                                        | STATUS                                                                                                           |
|----------------------------------|-----------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| City of Glenwood                 | Location and Extent Permit (L&E)        | Project proposed by a quasi-governmental agency                                    | City of Glenwood Springs Code of Ordinances 070.060.050(d) | RFTA and application preparers are complying through this permit application and subsequent process for approval |
| City of Glenwood Springs         | Matters of State Interest (1041) Permit | Site selection of rapid or mass transit terminals, stations, and fixed guideways   | City of Glenwood Springs Code of Ordinances 070.080.030    | RFTA and application preparers are complying through this permit application and subsequent process for approval |
| City of Glenwood                 | Building Permit                         | New construction of commercial buildings                                           | City of Glenwood Springs Code of Ordinances 2022-16        | Once planning approval has been granted, project will be submitted for Building Permit review.                   |
| COGS                             | Grading & Row Permit                    | Moving of more than 50 CY of soil and implementation of turn lanes in Wulfsohn ROW | City of Glenwood Springs Engineering                       | Prior to work conducted by TBD contractor, both permits will be submitted for review.                            |
| Colorado State of Transportation | CDOT Local Agency Project Approval      | CDOT is administrator of federal funding for 6A                                    | NA                                                         | 30% FIR completed. Waiting submittal of 30% FOR for review.                                                      |

**3. Copies of relevant official federal and state consultation correspondence prepared for the project; a description of all mitigation required by federal, state, and local authorities; and copies of any draft or final environmental assessments or impact statements required for the project.**

Please see attached Initial Site Assessment for this documentation. See Appendix K

**4. Details of the source and rights for the water supplies for the system, including any permits, decrees, or contracts for such rights, or the application submitted for change of water rights, appropriation of water, or augmentation plans.**

Not requested, not provided.

**5. Proof of ownership or a contractual right to develop the property.**

See Appendix A that includes proof of ownership and concurrent right to develop the property.

**(i) Land Use.**

**1. Provide a map at a scale relevant to the project and acceptable to the Community Development Department describing existing land uses and existing zoning of the proposed project area and the project service area, including peripheral lands which may be impacted. The land use map shall include but need not necessarily be limited to the following categories: residential, commercial, industrial, extractive, transportation, communication and utility, institutional, open space, outdoor recreation, agricultural, forest land and water bodies. Show all special districts (school, fire, water, sanitation, etc.) within the project area.**

See zone district map below, on page 31 that illustrate the project area and adjacent parcels. The proposed project is currently located in the Mixed Use Corridor (M1) zone district. According to the Glenwood Springs Municipal Code, Article 070.020.090, "The M1 district is intended to accommodate mixed-use development with walkable and active streetscapes on Glenwood's primary roadways. The mix of uses in the M1 district is intended to accommodate lighter-intensity commercial districts with limited auto-oriented uses compatible with surrounding residential neighborhoods. The M1 district is also intended to offer a diverse mix of housing opportunities at varying densities." The table below outlines the dimensional standards required for any proposed development within the M1 District.

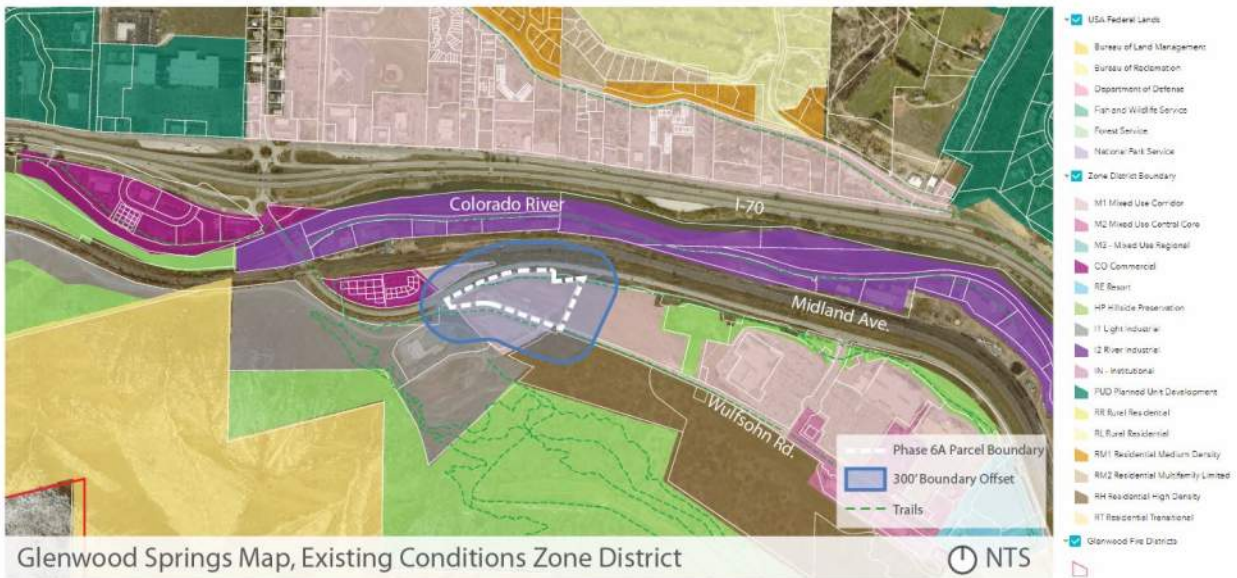
The existing conditions of surrounding parcels are a mix of Mixed Use Corridor (M1), Light Industrial (I1), River Industrial (I2), Commercial (CO), and Hillside Preservation (HP) zoning districts. There are no special districts located within the project area.



| Table 020.11: M1 District   |                                      |      |
|-----------------------------|--------------------------------------|------|
| Dimensional Standards       |                                      |      |
| Lot Standards, Minimum      |                                      |      |
| A                           | Lot area (sq ft)                     | None |
|                             | Landscaped area (%)                  | 15   |
| Setbacks, Minimum           |                                      |      |
| B                           | Front, min (ft)                      | 5    |
|                             | Front, max (from arterials) (ft)     | 60   |
|                             | Front, max (from other streets) (ft) | 25   |
| C                           | Side, min (ft)                       | 5    |
| D                           | Rear, with alley, min (ft)           | 10   |
|                             | Rear, without alley, min (ft)        | 7.5  |
| Building Standards, Maximum |                                      |      |
| E                           | Building height (ft)                 | 40   |

**2. All immediately affected public land boundaries should be indicated on the map. Potential impacts of the proposed development upon public lands will be visually illustrated on the map as well as described in the text.**

See table below for a list of adjacent owners whose parcels are completely or partially contained within 300 ft. of the project site. The Existing Conditions Zone District map below contextualizes the Phase 6A parcel boundary and 300' offset from this parcel. A traffic impact study was performed to evaluate the project's contribution to overall traffic patterns and how any increased densities or impacts could be mitigated. See the summary of traffic study on page 48 and the full Traffic Impact Study report in Appendix B.



| Parcel Number | Account Number | Address                                          | Owner Name                            | Owner Address                                     |
|---------------|----------------|--------------------------------------------------|---------------------------------------|---------------------------------------------------|
| 218505338014  | R041501        | Not available                                    | CENTURA VENTURES LLC                  | 8100 E MINERAL CIRCLE ENGLEWOOD, CO 80112         |
| 218505337003  | R041405        | Not available                                    | ROARING FORK TRANSPORTATION AUTHORITY | 0766 INDUSTRY WAY CARBONDALE, CO 81623            |
| 218508143001  | R084816        | Not available                                    | GLENWOOD MEADOWS, LLC                 | 710 E DURANT AVENUE, SUITE W6 ASPEN, CO 81611     |
| 218505336004  | R084609        | Not available                                    | ROARING FORK TRANSPORTATION AUTHORITY | 2307 WULFSOHN ROAD GLENWOOD SPRINGS, CO 81601     |
| 218505336002  | R009187        | 2307 WULFSOHN RD<br>GLENWOOD SPRINGS CO<br>81601 | ROARING FORK TRANSPORTATION AUTHORITY | 1340 MAIN STREET CARBONDALE, CO 81623             |
| 218505336003  | R009188        | Not available                                    | GLENWOOD SPRINGS, CITY OF             | 101 W 8TH STREET GLENWOOD SPRINGS, CO 81601       |
| 218505335004  | R009105        | Not available                                    | GLENWOOD SPRINGS, CITY OF             | 101 W 8TH STREET GLENWOOD SPRINGS, CO 81601       |
| 218505335003  | R009104        | 130 MIDLAND AVE<br>GLENWOOD SPRINGS CO<br>81601  | INTEGRATED MOUNTAIN GROUP INC         | 1001 GRAND AVENUE #201 GLENWOOD SPRINGS, CO 81601 |

### 3. Specify whether and how the proposed project conforms to the Comprehensive Plan.

Glenwood Springs Comprehensive Plan is a guide for making future land use decisions based on the collective values and visioning of the community. The Comprehensive Plan outlines strategies and actions to address future growth across various avenues such as; Land Use & Future Growth, Community Vitality, Tourism Management, Transportation & Mobility, Housing, etc. RFTA has been specified as a responsible party in the Comprehensive Plan to implement and promote transit oriented development. According to the Comprehensive Plan, "Redeveloped areas of the city provide the opportunity to create compact forms of development that are transit-supportive. These development types are located along transit corridors and are intended to support walking, biking, and public transit. The City and the Roaring Fork Transportation Authority (RFTA) should continue to promote redevelopment and the expansion of transit infrastructure to enhance the regional bus service, including Bus Rapid Transit (BRT) between Aspen and Glenwood Springs, and station improvements in Glenwood Springs."

The project supports the goals outlined in the Comprehensive Plan by improving and rebuilding aging infrastructure. The proposed project will be activating and expanding on an existing transit station to meet current and future demand of transit users. With the additional bus bays and improved site amenities, this development will enhance the commuter experience and promote transit oriented mobility in West Glenwood Springs.

In addition, looking at land use designations surrounding the proposed project site, the future development in this area shall include mixed-use and multi-family residential districts that will have a direct connection, due to their close proximity, to the transit center. Not only will the project be collecting

and encouraging commuters who are entering Glenwood Springs and heading up valley to take public transit, but the location makes it highly accessible to an expanding community in West Glenwood.

***4. Specify whether and how the proposed project conforms to applicable regional and state planning policies.***

RFTA has been in constant coordination with local agencies (COGS, CDOT) to ensure planning policies and application are being conformed to. Specifically, as part of the grant funding requirements, the project will be need approval from CDOT Region 3 after an extensive review prior to completion. CDOT will also manage a portion of the project during construction as well.

***5. Specify whether and how the proposed project conforms to applicable federal land management policies.***

There are no federal land uses applicable to this site.

***6. Specify how the proposed project will utilize existing easements or right-of-way to achieve project objectives.***

The Project relies on the use of the public right-of-way to provide transit services to the general public. No existing easements are necessary for the function of the project.

***7. If relevant to the project design, describe the agricultural productivity capability of the land in the project area, using Soils Conservation Service soils classification data.***

Not requested, not provided.

***8. Describe the probability that the project may be significantly affected by earthquakes, floods, fires, snow, slides, avalanches, rockslides or landslides and any measures that will be taken to reduce the impact of such events upon the project.***

Based on Geotechnical Report provided by WSP on August 25, 2023, the design team is following WSP's Compaction Grouting Ground Improvement with spread footings for building components to help combat poor existing soil conditions

***9. Specify if excess service capabilities created by the proposed project will prove likely to generate sprawl or strip development.***

Not requested, not provided.

***10. Specify whether the demand for the project is associated with development within or contiguous to existing service areas.***

The project is intended to serve the existing community and the projected population growth of the region. The success of the project is not dependent on additional development within the service area.

**(j) The Director may require submission of any plan, study, survey, or other information, in addition to the information required by this Section, at the applicant's expense, as in the Director's judgment is necessary to enable it to review and act upon the application.**

At time of submission, no additional information has been requested.

**(k) Any application which requires compliance with Section 24-65.5-101, et seq., C.R.S. (Notification to Mineral Owners of Surface Development), shall not be considered to have been submitted as complete**

until the applicant has provided a certification signed by the applicant confirming that the applicant or its agent has examined the records of the County Clerk and Recorder for the existence of any mineral estate owners or lessees that own less than full fee title in the property which is the subject of the application, and stating whether or not any such mineral estate owners or lessees exist. In addition, for purposes of the City convening its initial public hearing on any application involving property which mineral estate owners or lessees owning less than full fee title in the property have been certified by the applicant to exist, the application shall not be considered to have been submitted as complete until the applicant has provided an additional signed certification confirming that the applicant has, at least 30 days prior to the initial public hearing, transmitted to the City and to the affected mineral estate owners and lessees the notices required by Section 24-65.5-101, et seq., C.R.S.

Owner Certification is included in Appendix F

**(I) Project Development Schedule.**

***1. An estimate of the maximum number of employees, number of shifts and employees per shift during the following phases: construction, operation, and maintenance.***

The number of employees during construction will peak at approximately 50 with one 10 hour shift from 7 am to 5 pm Monday through Friday The number of employees during operation within the facility is estimated to be 5 with 2 shifts, 4 am to 1 pm and 1 pm to 10 pm The number of employees for maintenance in the facility and the grounds will be 2 daily between 6am and 5 pm.

***2. Information regarding any future phases or extensions of the facility and relationship of the facility (if currently foreseen) to larger programs and plans.***

No further phases or extensions of the facility are currently contemplated.

***3. A timetable for planning (e.g., federal permits, state permits, local zoning, etc.).***

Construction of the proposed project is expected to begin on 2/2/25, pending permit approvals. The table on page 19, outlines and describes all expected permits required for the project. Appendix E provides additional information regarding the anticipated schedule for the project.

***4. An estimate beginning and completion of construction and beginning of operation of facility or system.***

The project is expected to be completed and the facility to be in service by 9/30/26. Appendix E provides additional information regarding the anticipated schedule for the project.

***5. A description of any support facilities (e.g. pollution control parking areas, landscaping, etc.) to be provided.***

For a description of the landscaping and any potential impacts to vegetation and wildlife, please see page 13. As noted above, the design team is utilizing underground stormwater detention as indicated on the civil plans.

***6. A description of any feasible “non-structural” alternatives to meet the objectives of the proposed site selection and construction.***

Not requested, not provided.

**(m) Financial Information.**

***1. Relevant bond issue, loan and other financing approvals or certifications (ex: approved bond issues; bond counsel opinion).***

No Bond issue or council will be necessary for construction of this project. The project is funded by a FHWA RAISE grant(4.8 million) FTA LOW/NO grant (33 Million) and RFTA General Fund Balance.

***2. A description of the intended financial/economic impacts on the proposed project on the City and surrounding area.***

The improved transit system, due to a more efficient transit station, will help to continue to improve ridership and help reduce personal vehicle traffic across the Roaring Fork Valley. The additional electric bus chargers will also increase RFTA's use of this fleet and will help reduce the use of fossil fuel vehicles. The additional opportunities for Bustang this transit station will help to increase ridership across that system as well.

***3. Business plan that generally describes the financial feasibility of the project.***

RFTA has worked closely with FTA and other federal partners and have been awarded multiple grants to assist in payment for this project.

***4. A plan to offset increased demand on the City's existing facilities, systems, or public utilities.***

RFTA does not anticipate a major increases of demand as this project includes improvements to existing facilities and systems. The new design does implement improved water quality and geothermal systems to assist with heating and cooling of transit station.

**(n) Local Infrastructure and Service Impacts. An impact analysis that addresses the manner in which the applicant will comply with the relevant permit application review criteria. The impact analysis shall include the following information: description of existing capacity of and demand for local government services including but not limited to roads, schools, water and wastewater treatment, water supply, emergency services, transportation, infrastructure, and other services necessary to accommodate the project within the City.**

The net impacts are anticipated to be very minor as this project is to provide improvements to an already existing transit stop. The provided traffic study, drainage report, environmental impact assessment describe these impacts and the design responds to the recommendations in these report by incorporating them into the design.

**(o) Recreational Opportunities. Description of the impacts and net effect of the project on present and potential recreational opportunities.**

The project will not directly impact access to or use of nearby public open space. The increase ease of public transportation connectivity to the transit center from locations within and outside the City of Glenwood Springs will increase recreational opportunities for the public. This includes facilitating travel to the Glenwood Recreation Center, access to nearby hiking and mountain bike trails, and access to the Colorado River Whitewater Park, all located within walking distance of the station.

**(p) Social Impacts. A description of other intended social impacts of the proposed project, including, by way of illustration, increased access to relevant services.**

RFTA's goal for 6A is to improve the rider experience and increase services for the greater West Glenwood area for both RFTA and CDOT bus transit. The installation of the new electrical chargers for RFTA buses will also increase opportunities for their electric fleet in the future.

**(q) Areas of Paleontological, Historic, or Archaeological Importance. Description of the impacts and net effect of the project on sites of paleontological, historic, or archaeological interest.**

As previously stated, based on the provided historical and archaeological assessments, we see no impacts from this project.

**(r) Nuisance. Descriptions of noise, glare, dust, fumes, vibration, and odor levels anticipated to be caused by the project.**

RFTA sees no major impacts as each site being developed has similar pre-existing uses.

**(s) Air Quality. Description of the impacts and net effect that the project would have on air quality during both construction and operation, and under both average and worst case conditions, considering particulate matter and aerosols, oxides, hydrocarbons, oxidants, and other chemicals, temperature effects and atmospheric interactions.**

We see no major impacts as each site being developed have similar pre-existing uses.

**(t) Visual Quality. Description of the impacts and net effect that the project would have on visual quality, considering viewsheds, scenic vistas, unique landscapes or land formations within view of the project area.**

As described previously, the transit center project is a rebuild of the existing transit stop so the project will have minimal impacts on visual quality. There will be increased operations including the addition of bus bays and larger facilities however, due to the existing conditions currently operating as a bus stop, no significant impact to the viewsheds and scenic vistas is anticipated. The ridgeline of Red Mountain is approximately 1500 vertical feet above the project site and the project will not impact the ridgeline.

Additionally, the Historical Resources review notes that the proposed project does not impact any historic visual resources.

**(u) Surface Water Quality.**

***1. Map and/or description of all surface waters relevant to the project, including description of provisions of Region XII's regional water quality management plan, and NPDES Phase II Permit and necessary Erosion and Stormwater Quality Control Permit ("ESQCP"), Section 404 Federal Clean Water Act Permit that applies to the project and assessment of whether the project would comply with those provisions.***

Not requested, not provided.

***2. Existing data monitoring sources.***

Not requested, not provided.

**3. Descriptions of the immediate and long-term impact and net effects that the project would have on the quantity and quality of surface water under both average and worst-case conditions.**

The expansion of the Transit center will result in an increase in impervious area. The additional impervious area will increase runoff from the site and the potential for sediment and pollutants to be carried in this runoff. SEH will grade the site to capture runoff where feasible and divert the runoff to water quality and detention facilities. These facilities will mitigate the sediment and pollutants in runoff. The outlet structures of the facilities will restrict flows in the major and minor storms to be release at preconstruction rates to minimize adverse impacts on adjacent and downstream drainageways and properties. Each phase will have a different approach to this.

The Transit Center (Phase 6A) proposes an underground storage facility to be used for water quality and detention. Flows will be routed to the facility through proposed inlets and storm sewer. Flows will be released at historic rates to the north.

The Administration Building (Phase 6B) will propose inlets and storm sewer to carry flows to the west where they will join with existing infrastructure and be conveyed to the existing ponds on the northwest side of the site. These flows were accounted for in the master drainage plan. SEH will confirm that the proposed design will conform with the anticipated flows from the master drainage plan.

Storage Building A (Phase 8) will have little effect on the drainage patterns. Flows will be diverted overland around the building to the west as laid out in the master drainage plan. SEH will confirm that the proposed design will conform with the anticipated flows from the master drainage plan.

**(v) Groundwater Quality.**

**1. Map and/or description of all groundwater, including any and all aquifers relevant to the project. At a minimum, the description should include:**

- a. Seasonal water levels in each portion of the aquifer affected by the project.**
- b. Artesian pressure in said aquifers.**
- c. Groundwater flow directions and levels.**
- d. Existing aquifer recharge rates and methodology used to calculate recharge to the aquifer from any recharge sources.**
- e. For aquifers to be used as part of a water storage system, methodology and results of tests used to determine the ability of the aquifer to impound groundwater and aquifer storage capacity.**
- f. Seepage losses expected at any subsurface dam and at stream-aquifer interfaces and methodology used to calculate seepage losses in the affected streams, including description and location of measuring devices.**
- g. Existing groundwater quality and classification.**
- h. Location of all water wells potentially affected by the project and their uses.**

Not requested, not provided.

**2. Description of the impacts and net effect of the project on groundwater.**



Not requested, not provided.

**(w) Water Quality.**

**1. Map and/or description of existing stream flows and reservoir levels relevant to the project.**

Not requested, not provided.

**2. Map and/or description of existing minimum stream flows held by the state Water Conservation Board.**

Not requested, not provided.

**3. Descriptions of the impacts and net effect that the project would have on water quantity.**

While the net impacts are anticipated to be very minor, we do see increased water use due to additional fixtures from existing facilities.

**4. Statement of methods for efficient utilization of water, including recycling and reuse.**

Untreated raw water will be the exclusive source for irrigation of the landscaping and revegetation. Toilets and other plumbing fixtures have been selected for water efficiency.

**5. Descriptions on the impacts to riparian vegetation and fisheries.**

Not requested, not provided.

**(x) Floodplains, Wetlands, and Riparian Areas; Terrestrial and Aquatic Animals, Plant Life, and Habitat. Applicant shall only provide description of foregoing natural conditions, animal and plant life at, but not to exceed, the level of detail required by other federal or state permits or reviews which are applicable to the project.**

Not requested, not provided.

**(y) Soils, Geologic Conditions, and Natural Hazards.**

**1. Map and/or description of soils, geologic conditions, and natural hazards including but not limited to soil types, drainage areas, slopes, avalanche areas, debris fans, mud flows, rockslide areas, faults and fissures, seismic history, and wildfire hazard areas, all as relevant to the project area.**

See the Geotechnical Report included in the Appendix.

**2. Descriptions of the risks to the project from natural hazards.**

Poor soils are present on site which will require mitigation through tailored soil improvements and foundation design specific to this type of development.

**3. Descriptions of the impacts and net effect of the project on soil and geologic conditions in the area.**

Soils are to be improved in the area of disturbance as directed by the Geotechnical investigation. Proper stormwater management will also assist in improvement conditions on the site

**(z) Hazardous Materials.**

***1. Description of all solid waste, hazardous waste, petroleum products, hazardous, toxic, and explosive substances to be used, stored, transported, disturbed or produced in connection with the project, including the type and amount of such substances, their location, and the practices and procedures to be implemented to avoid accidental release and exposure.***

RFTA does not anticipate hazardous materials being generated by or used for this project.

***2. Location of storage areas designated for equipment, fuel, lubricants, and chemical and waste storage with an explanation of spill containment plans and structures.***

RFTA does not anticipate storage of these types of materials for this project.

**(aa) Monitoring and Mitigation Plan.**

***1. Description of all mitigation that is proposed to avoid, minimize or compensate for adverse impacts of the project and to maximize positive impacts of the project.***

RFTA has taken several measures to ensure quality control and mitigation of any adverse impacts from this project by contracting with multiple independent sub-contractors to ensure all the proper checks are being made for the design of the project. During construction, RFTA will sub-contract construction management services to ensure the selected contractor is adhering to the construction documents and other requirements.

***a. Describe how and when mitigation will be implemented and financed.***

This has been implemented and will continue throughout the duration of the project and is financed by RFTA.

***b. Describe impacts that are unavoidable that cannot be mitigated.***

RFTA does not anticipate any unavoidable adverse impacts which cannot be mitigated.

***2. Description of methodology used to measure impacts of the project and effectiveness of proposed mitigation measures.***

RFTA does not anticipate any impacts that will require measuring and mitigation.

***3. Description, location, and intervals of proposed monitoring to ensure that mitigation will be effective.***

Weekly Owner-Architect meetings are currently underway and weekly Owner-Architect-Contractor meetings with the Construction Management team will occur during construction.

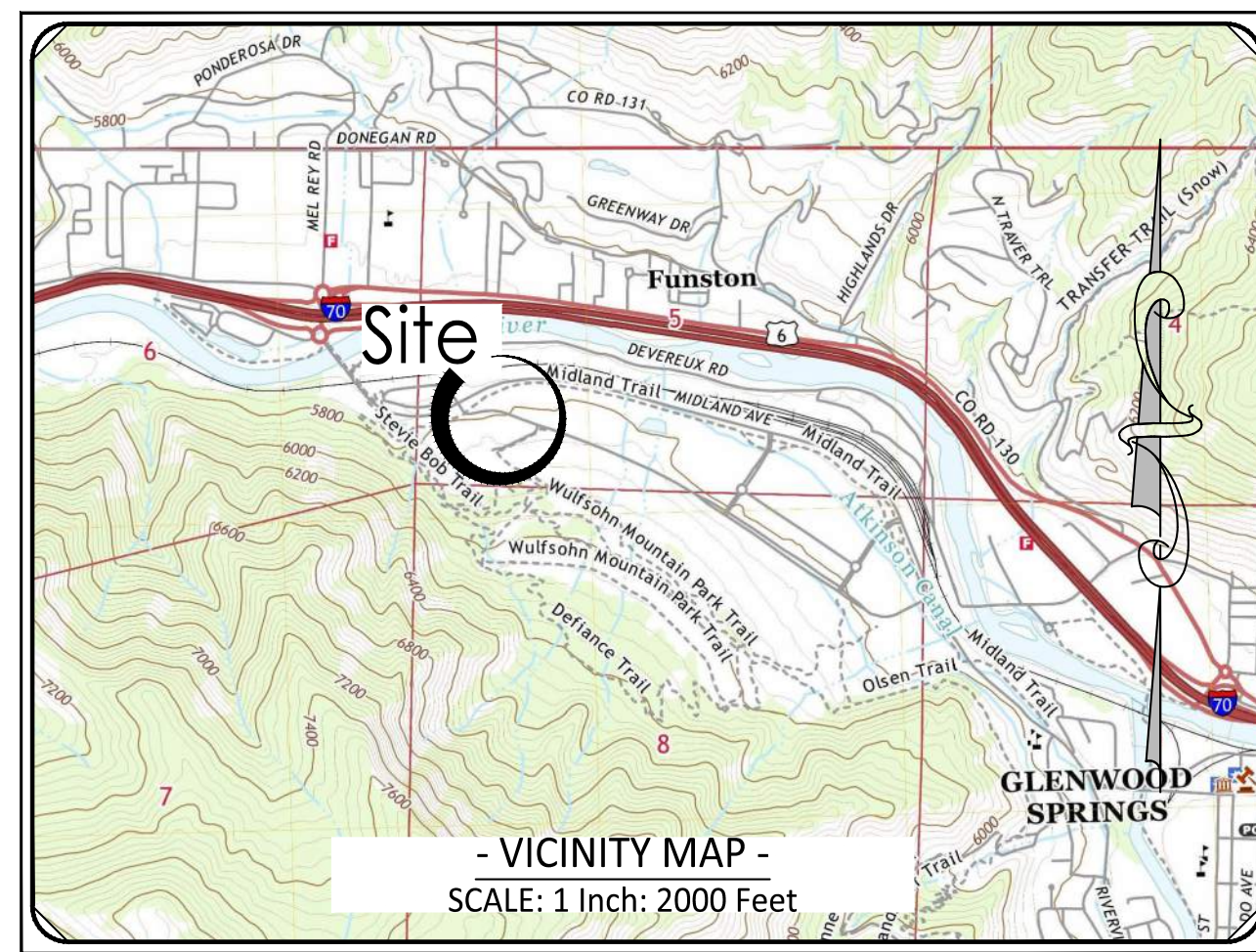
***4. Emergency procedures to be used in the event of a fire, explosion, or other event which may endanger the public health, safety, and welfare.***

All building and site elements are being designed to mitigate or ensure code requirements are met. During construction, Contractor will be made responsible by means of the contract and other regulatory agencies to adhere to such procedures and to ensure they are in place during construction.

**(bb) Additional Information.** The Director may request that the applicant supply additional information related to the project if the Director and/or the Permit Authority will not be able to make a determination on any one of the applicable review criteria without the additional information. Such additional information may include applicant's written responses to comments by a referral agency.

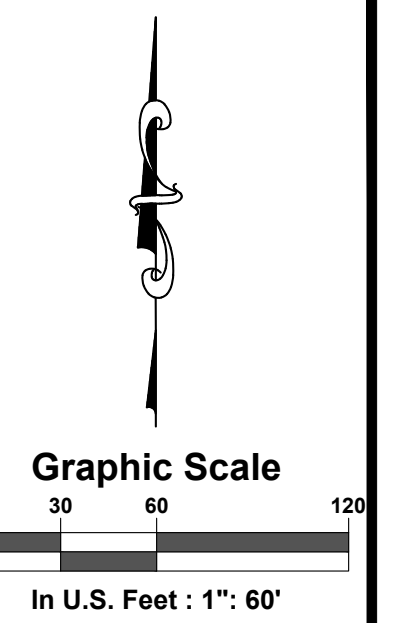
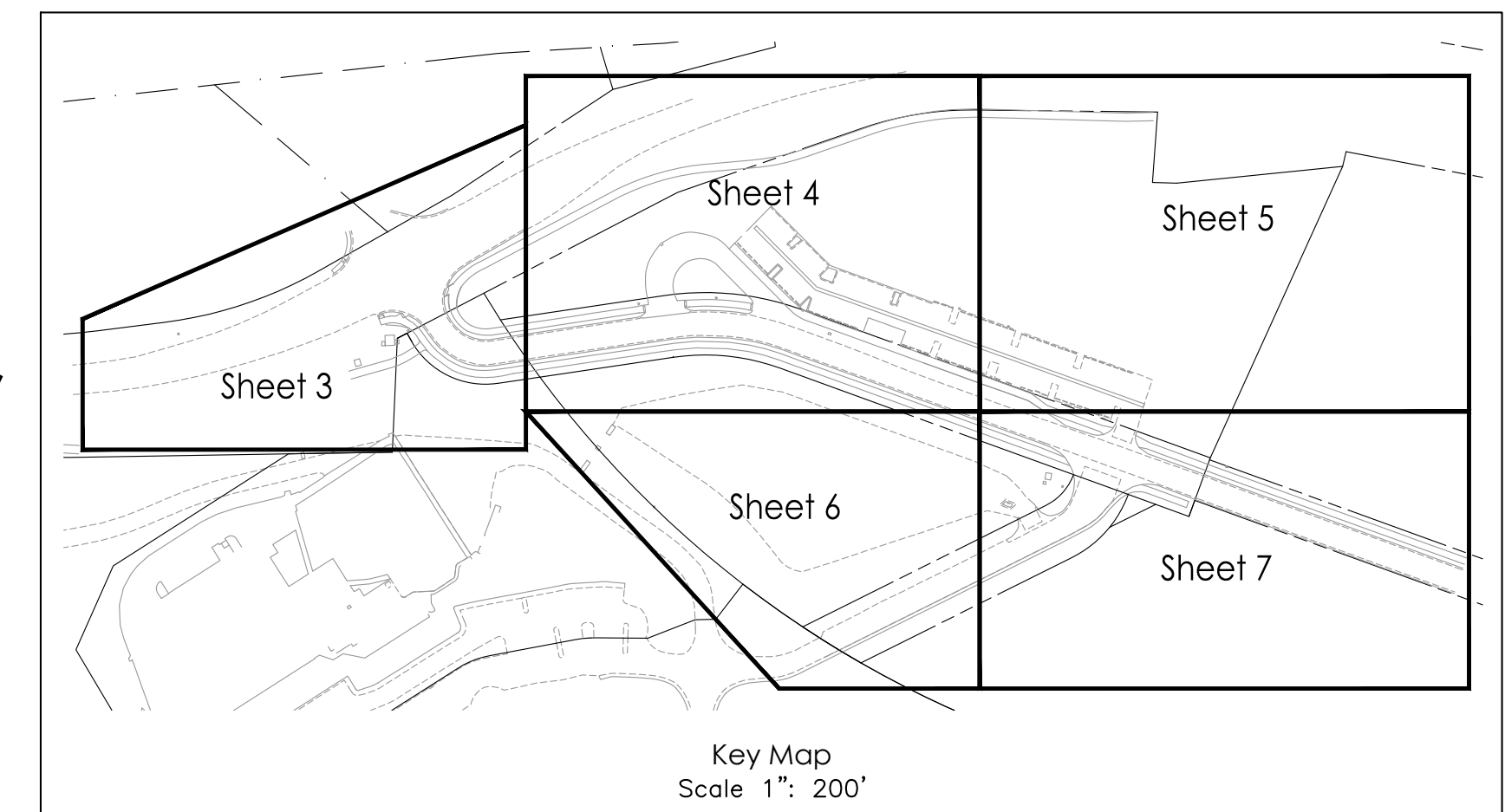
At the time of this submission, no additional information has been requested.





## Existing Conditions Map

Situated in all or parts of Lots A (Amended), Lot B and Lot C of Glenwood Springs Municipal Operations Center Subdivision,  
And Parcels A and Entrance Parcel of Glenwood Meadows No. 1 Subdivision,  
City of Glenwood Springs, Garfield County, Colorado



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**Roaring Fork Transportation  
Authority (RFTA)  
Glenwood Springs, Colorado**

| Case No. | Case Name | Case Status | Case Description | Case Outcome | Case Date |
|----------|-----------|-------------|------------------|--------------|-----------|
| 1        | 1         | 1           | 1                | 1            | 1         |
| 2        | 2         | 2           | 2                | 2            | 2         |
| 3        | 3         | 3           | 3                | 3            | 3         |
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|           |                  |
|-----------|------------------|
| Job No.   | 2019-547.004     |
| Drawn by: | MEW              |
| Date:     | 4/21/2023        |
| Approved: | PLS: RLB         |
| File:     | RFTA_Admin_ExCon |
| Location: |                  |

### Existing Conditions Map

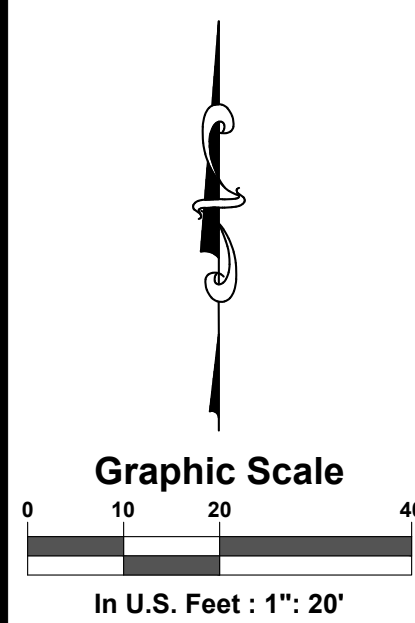
Sheet No.

f: 7



Existing Conditions Map

Situated in all or parts of Lots A (Amended), Lot B and Lot C of Glenwood Springs Municipal Operations Center Subdivision, And Parcels A and Entrance Parcel of Glenwood Meadows No. 1 Subdivision, City of Glenwood Springs, Garfield County, Colorado



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EXISTING UTILITY NOTES – NON "SUE-REQUIRED PROJECT"

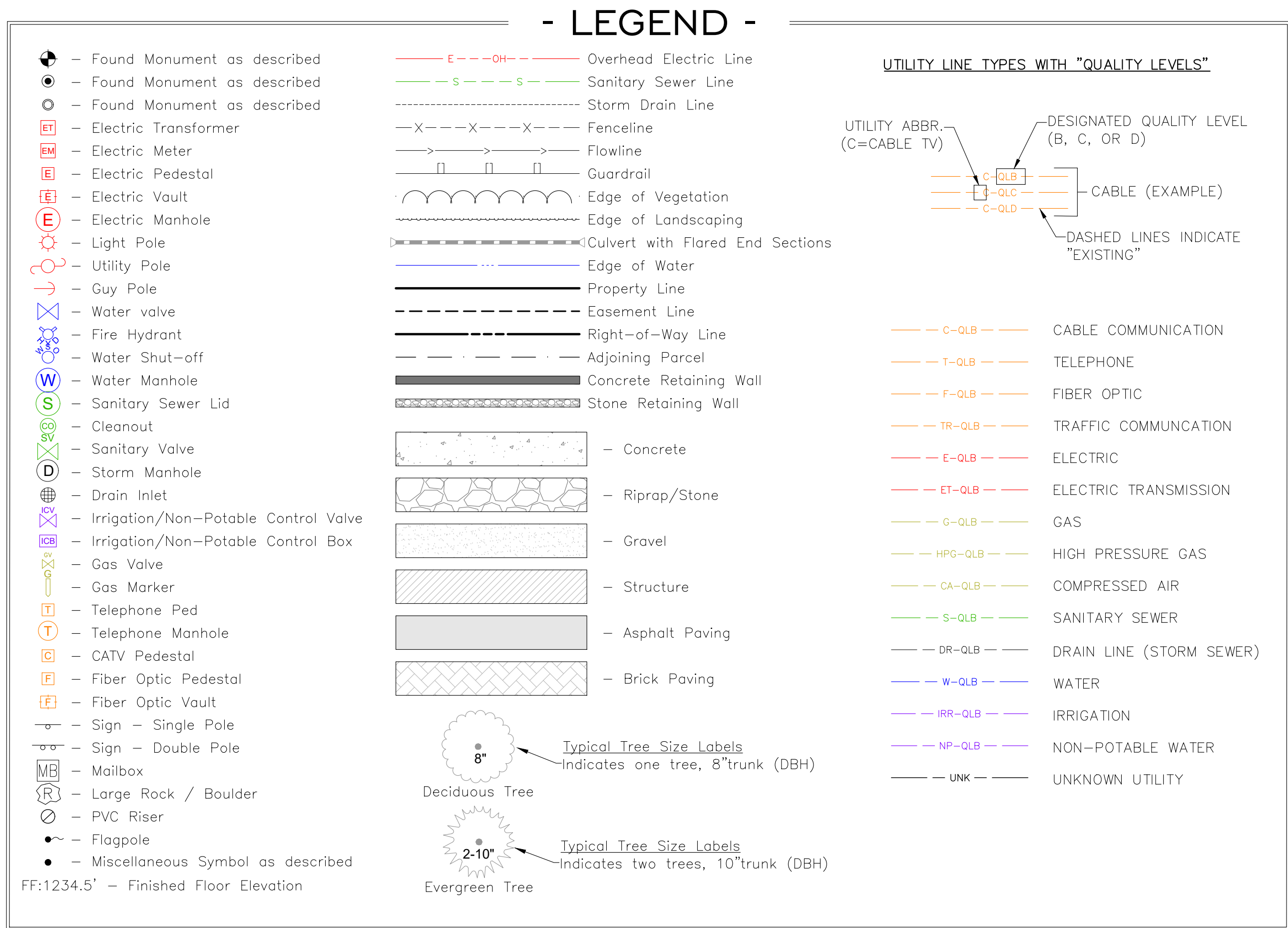
1. THIS PROJECT DOES NOT MEET THE CONDITIONS FOR A "SUBSURFACE UTILITY ENGINEERING-REQUIRED PROJECT," AS SET FORTH IN THE 8/8/2018 COLORADO STATE LAW. SEE CHECKLIST BELOW FOR WHY WE DETERMINED THIS TO BE NOT "SUE-REQUIRED". (NOTE: A PROJECT MUST MEET ALL 4 CONDITIONS)

| COLORADO REVISED STATUTES (CRS) 2018 TITLE 9-1.5-102 SUBSURFACE UTILITY ENGINEERING (SUE) REQUIRED PROJECT COMPLIANCE CHECKLIST |                             |                                                                                                                 |   |     |   |    |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------|---|-----|---|----|
| 1                                                                                                                               | 9-1.5-1<br>02-6.8.A         | PROJECT INVOLVES CONSTRUCTION CONTRACT WITH A PUBLIC ENTITY                                                     | X | YES |   | NO |
| 2                                                                                                                               | 9-1.5-1<br>02-6.8.B         | PROJECT INVOLVES PRIMARILY HORIZONTAL CONSTRUCTION AND DOES NOT INVOLVE PRIMARILY THE CONSTRUCTION OF BUILDINGS |   | YES | X | NO |
| 3A                                                                                                                              | 9-1.5-1<br>02-6.8.C<br>.1.A | EXCAVATION FOOTPRINT EXCEEDS 2-FOOT DEPTH AND IS A CONTIGUOUS 1,000-SQUARE FEET; OR                             |   | YES | X | NO |
| 3B                                                                                                                              | 9-1.5-1<br>02-6.8.C<br>.1.B | INVOLVES UTILITY BORING                                                                                         |   | YES | X | NO |
| 4                                                                                                                               | 9-1.5-1<br>03-2.4           | PROJECT REQUIRES THE DESIGN SERVICES OF A LICENSED PROFESSIONAL ENGINEER (P.E.)                                 |   | YES | X | NO |
| SUMMARY                                                                                                                         | 9-1.5-1<br>03-2.4           | REQUIRED TO MEET OR EXCEED THE ASCE 38 STANDARD AND CO SUE LAW?                                                 |   | YES | X | NO |

- \*\*\* NOTE: CHECKLIST ITEMS 2 THROUGH 5 ARE CURRENTLY IDENTIFIED AS "NO" AS THE EXACT SCOPE OF THE FUTURE PROJECT IS STILL UNKNOWN. THE PROJECT'S "SUE-REQUIRED STATUS" SHOULD BE REEVALUATED IN THE FUTURE.
2. EXISTING UTILITIES ARE DEPICTED ACCORDING TO THE BEST AVAILABLE INFORMATION THAT WAS PROVIDED BY THE UTILITY OWNERS AND SURFACE FEATURES AT THE TIME OF THE SURVEY. RELIANCE UPON THIS UTILITY DATA FOR RISK MANAGEMENT PURPOSES DOES NOT RELIEVE CLIENT/CONTRACTOR OR UTILITY OWNER FROM FOLLOWING ALL APPLICABLE UTILITY DAMAGE PREVENTION STATUTES, POLICIES, AND/OR PROCEDURES DURING EXCAVATION. PRIOR TO EXCAVATION, CLIENT/CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AT 811 OR 800-922-1987, TO VERIFY EXISTING UTILITIES AND HAVE LOCATIONS OF UNCC REGISTERED LINES MARKED BY MEMBER COMPANIES.
3. UTILITY QUALITY LEVELS ARE GENERALLY DEFINED BELOW. REFER TO ASCE 38 FOR MORE INFORMATION:
- 3.1 UTILITY QUALITY LEVEL "D" (QLD) – A VALUE ASSIGNED TO A SUBSURFACE UNDERGROUND UTILITY SEGMENT OR UTILITY FEATURE, WHOSE ESTIMATED POSITION IS JUDGED THROUGH UTILITY RECORDS, INFORMATION FROM OTHERS (SUCH AS UNCC 811 FIELD MARKS), OR FROM VISUAL CLUES SUCH AS PAVEMENT CUTS, OBVIOUS TRENCHES, OR EXISTENCE OF SERVICE.
- 3.2 UTILITY QUALITY LEVEL "C" (QLC) – A VALUE ASSIGNED TO A SUBSURFACE UTILITY SEGMENT, WHOSE ESTIMATED POSITION IS JUDGED THROUGH CORRELATING UTILITY RECORDS OR SIMILAR EVIDENCE TO UTILITY FEATURES, VISIBLE ABOVE AND/OR BELOW GROUND.
- 3.3 UTILITY QUALITY LEVEL "B" (QLB) – A VALUE ASSIGNED TO A SUBSURFACE UTILITY SEGMENT OR SUBSURFACE UTILITY FEATURE WHOSE EXISTENCE AND POSITION IS BASED UPON GEOPHYSICAL METHODS COMBINED WITH PROFESSIONAL JUDGMENT AND WHOSE LOCATION IS TIED TO THE PROJECT SURVEY DATUM.
- 3.4 UTILITY QUALITY LEVEL "A" (QLA) – A VALUE ASSIGNED TO THAT PORTION OF A SUBSURFACE UTILITY SEGMENT OR SUBSURFACE UTILITY FEATURE THAT IS DIRECTLY EXPOSED (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES), MEASURED, AND WHOSE LOCATION AND DIMENSIONS ARE TIED TO THE PROJECT SURVEY DATUM. (E.G. A TEST HOLE OR TEST PIT.)
4. OTHER UTILITIES MAY BE PRESENT WHICH WERE NOT IDENTIFIED IN THIS PLAN SET OR PRIOR TO CONSTRUCTION. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE DUE-DILIGENCE AND ENACT GOOD PRACTICES WHEN EXCAVATING NEAR POTENTIAL CONFLICT AREAS AND REDUCE POTENTIAL FOR DAMAGE TO FACILITIES AS MUCH AS POSSIBLE.
5. SHOULD THE CONTRACTOR ENCOUNTER UNKNOWN AND/OR ABANDONED UTILITY FACILITIES THE CONTRACTOR SHALL VERIFY WITH THE RESPECTIVE UTILITY OWNER THAT THE UTILITY MATERIAL IS INACTIVE/ABANDONED BEFORE REMOVAL FROM THE WORK AREA
6. THE CLIENT/CONTRACTOR SHALL COMPLY WITH COLORADO REVISED STATUTES (CRS) 2018, TITLE 9, ARTICLE 1.5-103 (10), "ALL NEW UNDERGROUND FACILITIES, INCLUDING LATERALS UP TO THE STRUCTURE OR BUILDING BEING SERVED, INSTALLED ON OR AFTER 8/8/2018, MUST BE ELECTRONICALLY LOCATABLE WHEN INSTALLED."

ABBREVIATIONS

|      |                                     |
|------|-------------------------------------|
| ADS  | ADVANCED DRAINAGE SYSTEM            |
| ASCE | AMERICAN SOCIETY OF CIVIL ENGINEERS |
| BHEN | BLACK HILLS ENERGY                  |
| BOP  | BOTTOM OF PIPE                      |
| C    | CABLE TELEVISION                    |
| CMCT | COMCAST                             |
| CNLK | CENTURYLINK (AKA LUMEN)             |
| COOS | CITY OF GLENWOOD SPRINGS            |
| DIP  | DUCTILE IRON PIPE                   |
| E    | ELECTRIC                            |
| EL   | ELEVATION                           |
| EX   | EXISTING                            |
| FM   | FORCED MAIN                         |
| FO   | FIBER OPTIC                         |
| G    | GAS                                 |
| GPR  | GROUND PENETRATING RADAR            |
| GR   | GRAVITY                             |
| INV  | INVERT                              |
| MH   | MANHOLE                             |
| PCL  | PIPE AND CABLE LOCATE               |
| PL   | PLASTIC                             |
| PRVT | PRIVATE                             |
| PVC  | POLYVINYL CHLORIDE (PLASTIC)        |
| QL   | QUALITY LEVEL                       |
| QLA  | QUALITY LEVEL A                     |
| QLB  | QUALITY LEVEL B                     |
| QLC  | QUALITY LEVEL C                     |
| QLD  | QUALITY LEVEL D                     |
| RCP  | REINFORCED CONCRETE PIPE            |
| RJ   | RESTRAINED JOINT                    |
| SAN  | SANITARY                            |
| SL   | STREET LIGHT                        |
| SMH  | SANITARY MANHOLE                    |
| STL  | STEEL                               |
| STM  | STORM                               |
| SUE  | SUBSURFACE UTILITY ENGINEERING      |
| T    | TELEPHONE                           |
| TH   | TEST HOLE                           |
| TOD  | TOP OF DIRT                         |
| TON  | TOP OF NUT                          |
| TOP  | TOP OF PIPE                         |
| UNKN | UNKNOWN                             |
| UTH  | UTILITY TEST HOLE                   |
| W    | WATER                               |



REVIEW COPY

Roaring Fork Transportation Authority (RFTA)

Glenwood Springs, Colorado

| # | Revision | Date | By: |
|---|----------|------|-----|
| 1 |          |      |     |
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Job No. 2019-547.004

Drawn by: MEW

Date: 4/21/2023

Approved: RLB

File: RFTA\_Admin\_ExCon

Location:

Existing Conditions Map

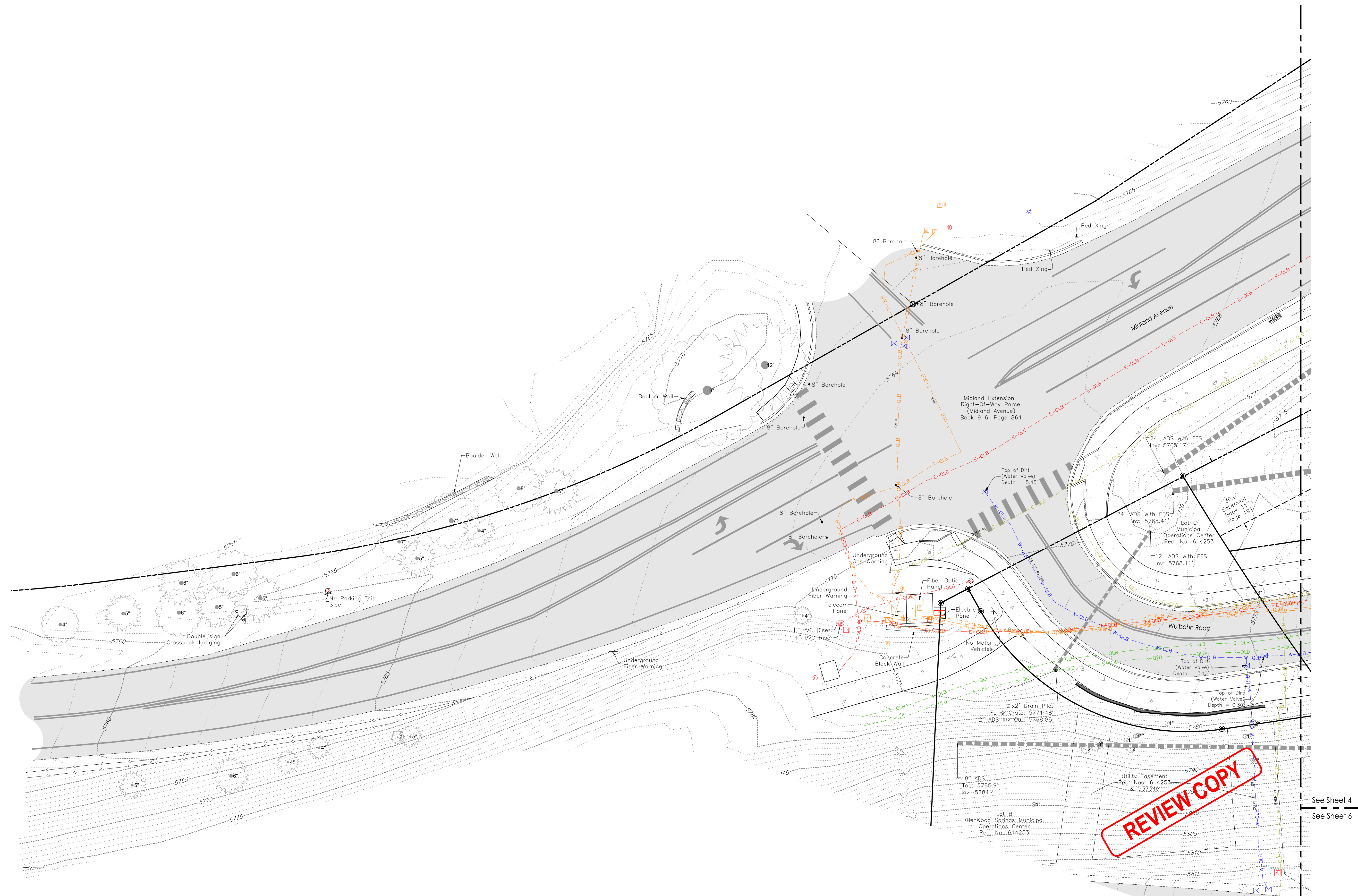
Sheet No.

2

Of: 7



Situated in all or parts of Lots A (Amended), Lot B and Lot C of Glenwood Springs Municipal Operations Center Subdivision,  
And Parcels A and Entrance Parcel of Glenwood Meadows No. 1 Subdivision,  
City of Glenwood Springs, Garfield County, Colorado



**Graphic Scale**

10 20 40

In U.S. Feet : 1" = 20'

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**Roaring Fork Transportation  
Authority (RFTA)  
Glenwood Springs, Colorado**

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According to Colorado law, you must complete any legal action based upon any defect in this survey within three years after you first discovered such defect. In no event may any legal action based upon any defect in this survey be commenced more than ten years from the date of the certification shown herein.

|           |                  |
|-----------|------------------|
| Job No.   | 2019-547.004     |
| Drawn by: | MEW              |
| Date:     | 4/21/2023        |
| Approved: | PLS: RLB         |
| File:     | RFTA_Admin_ExCon |
| Location: |                  |

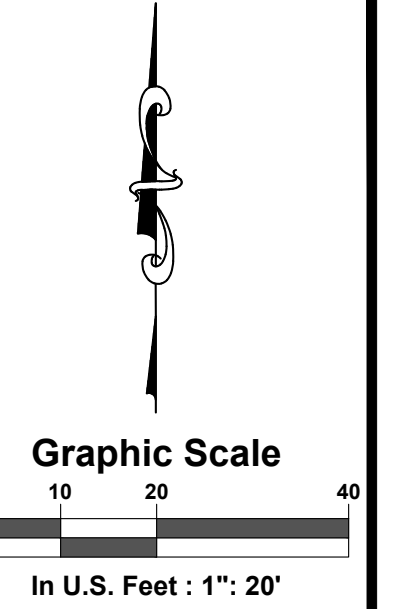
### Existing Conditions Map

Sheet No. **3**

f: 7



Situated in all or parts of Lots A (Amended), Lot B and Lot C of Glenwood Springs Municipal Operations Center Subdivision,  
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City of Glenwood Springs, Garfield County, Colorado



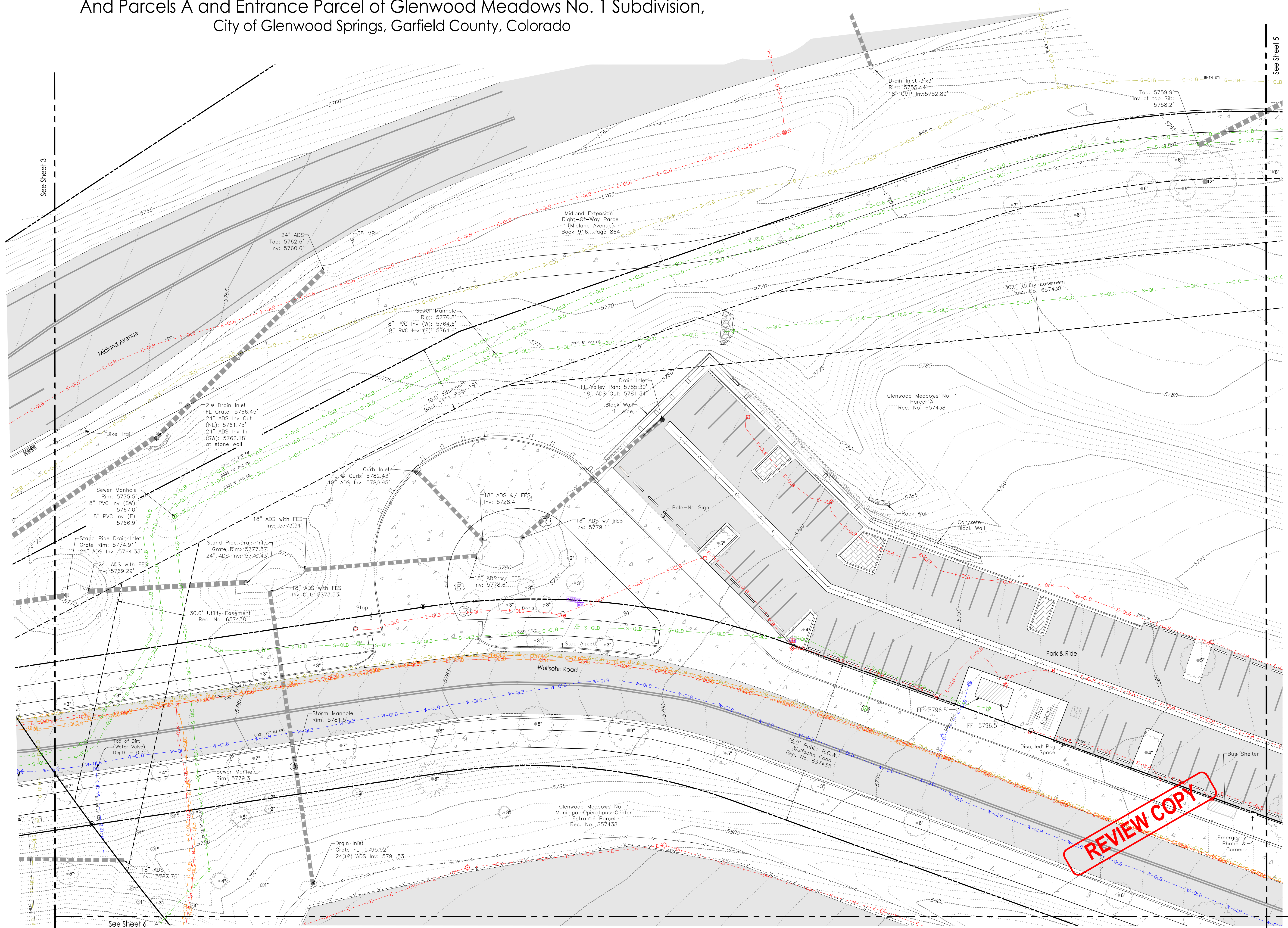
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**Roaring Fork Transportation  
Authority (RFTA)**  
Glenwood Springs, Colorado

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## Existing Conditions Map

Sheet No. **4**





Situated in all or parts of Lots A (Amended), Lot B and Lot C of Glenwood Springs Municipal Operations Center Subdivision,  
And Parcels A and Entrance Parcel of Glenwood Meadows No. 1 Subdivision,  
City of Glenwood Springs, Garfield County, Colorado



**Roaring Fork Transportation  
Authority (RFTA)**  
Glenwood Springs, Colorado

Location:

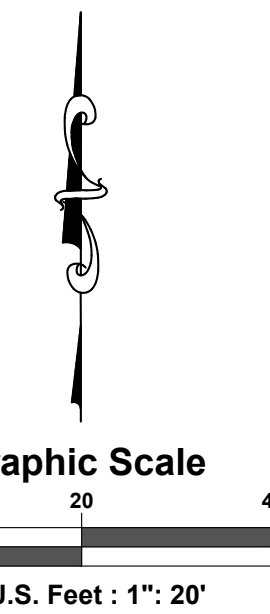
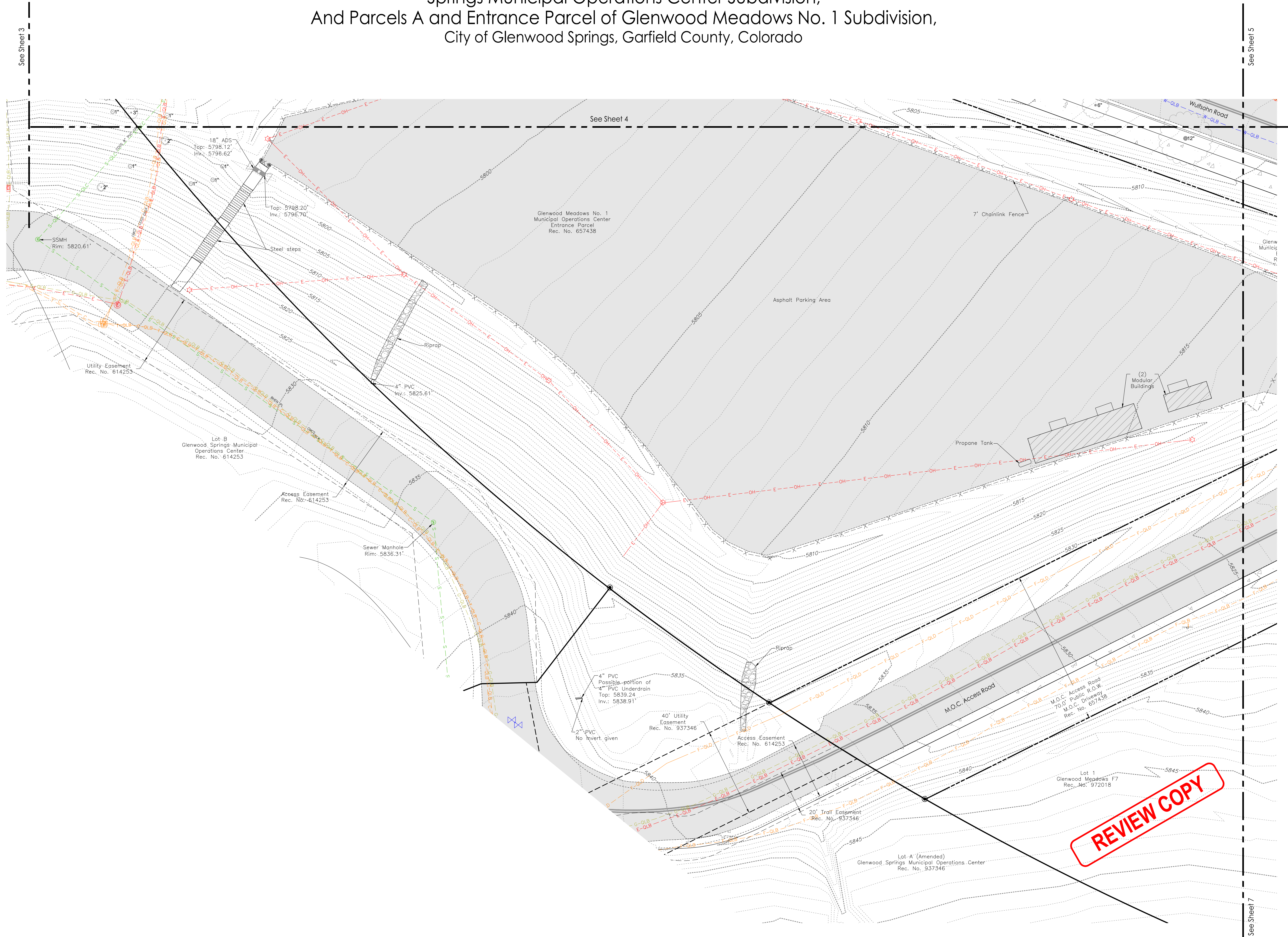
**Existing  
Conditions  
Map**

Sheet No. **5**

Of : 7



Situated in all or parts of Lots A (Amended), Lot B and Lot C of Glenwood Springs Municipal Operations Center Subdivision,  
And Parcels A and Entrance Parcel of Glenwood Meadows No. 1 Subdivision,  
City of Glenwood Springs, Garfield County, Colorado



**SGM**  
118 West Sixth Street, Suite 200  
Glenwood Springs, CO 81601  
970.945.1004  
[www.sgm-inc.com](http://www.sgm-inc.com)

**Roaring Fork Transportation  
Authority (RFTA)  
Glenwood Springs, Colorado**

|           |                 |    |
|-----------|-----------------|----|
| Job No.   | 2019-547-0000   |    |
| Drawn by: | JHE             |    |
| Date:     | 4/22/2020       |    |
| Approved: | PLS:            | RL |
| File:     | RFTA_Admin_ExcO |    |

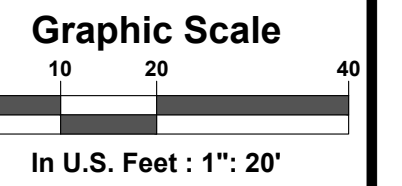
### Existing Conditions Map

Sheet No. **6**

Of: 7



Situated in all or parts of Lots A (Amended), Lot B and Lot C of Glenwood Springs Municipal Operations Center Subdivision,  
And Parcels A and Entrance Parcel of Glenwood Meadows No. 1 Subdivision,  
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**Roaring Fork Transportation  
Authority (RFTA)**  
Glenwood Springs, Colorado

[illegible]

|           |                  |
|-----------|------------------|
| Job No.   | 2019-547.004     |
| Drawn by: | MEW              |
| Date:     | 4/21/2023        |
| Approved: | .. PLS: RLB      |
| File:     | RFTA_Admin_ExCon |

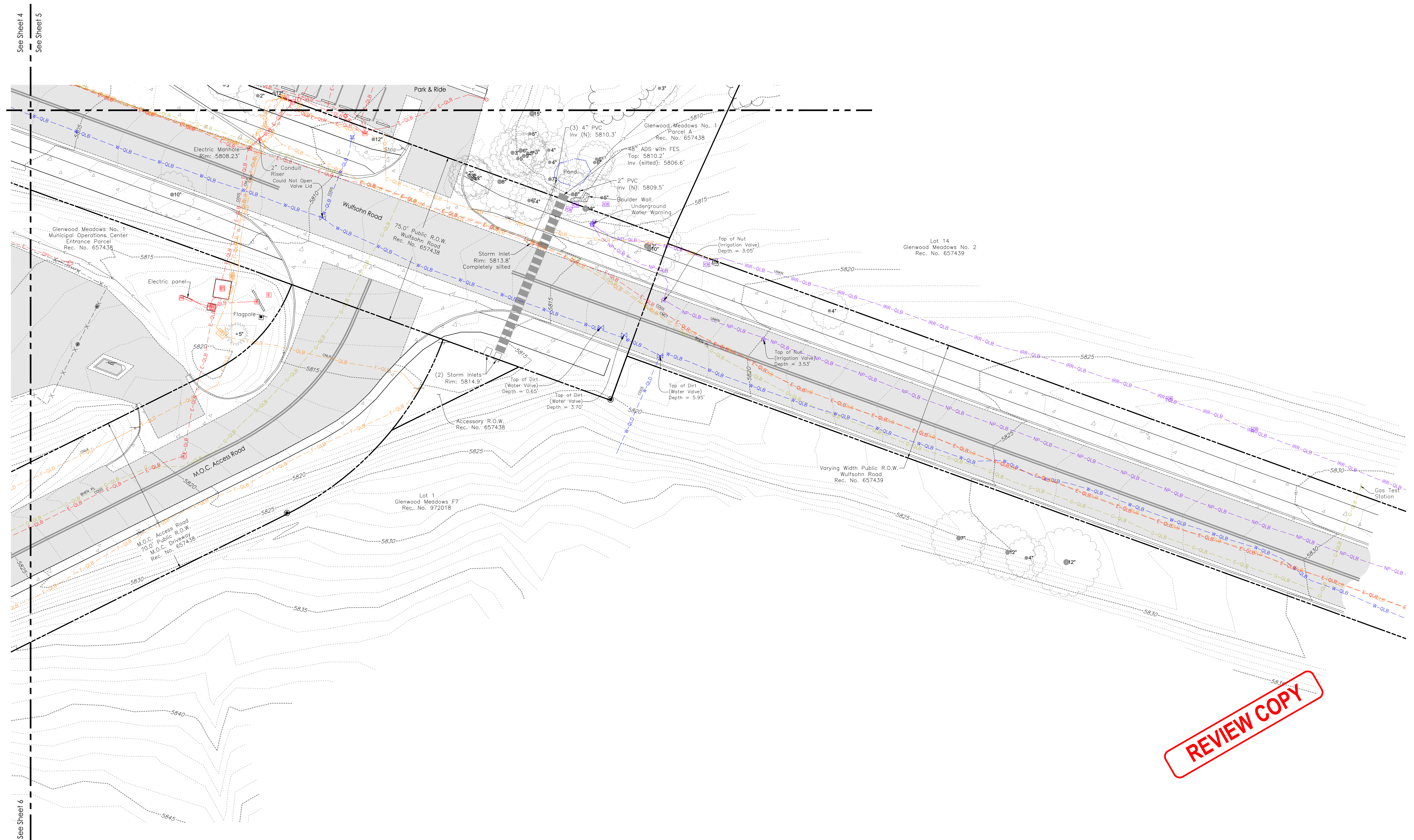
**Location:**

### Existing Conditions Map

Sheet No.

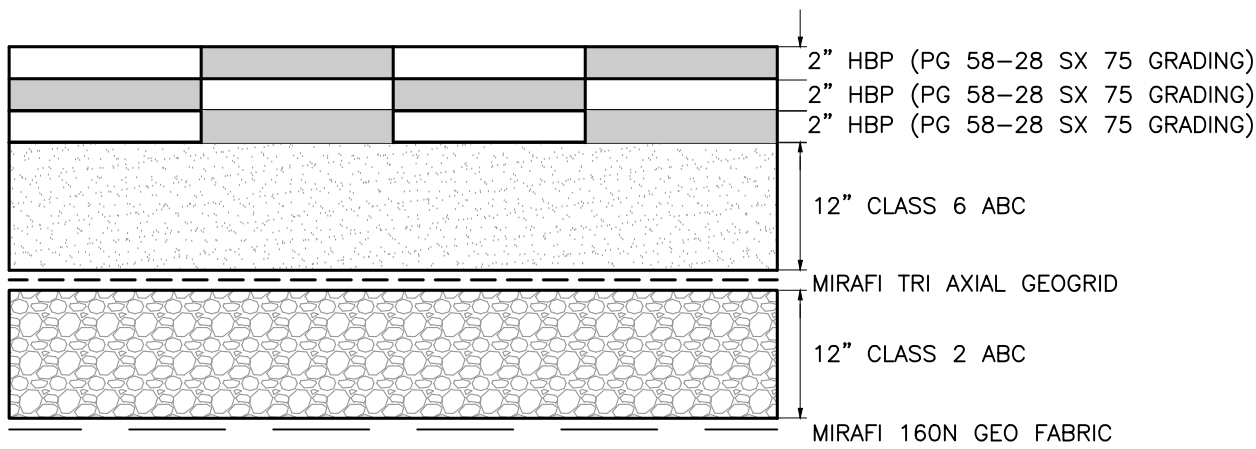
•

**f: 7**



**REVIEW COPY**

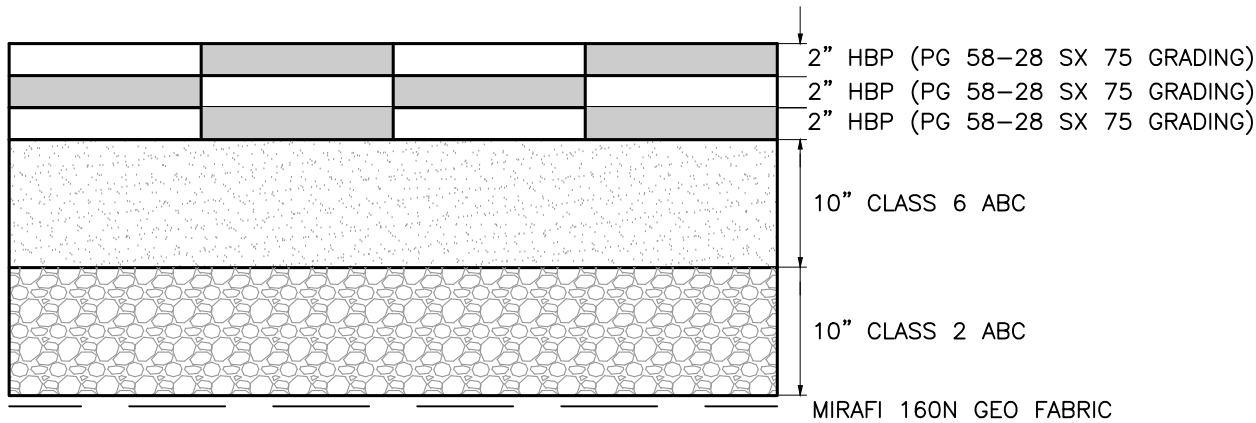




\*NOTE: SCARIFY AND RECOMPACT SUBGRADE 8" DEPTH TO 95% STANDARD OR 90% MODIFIED PROCTOR

**MUCK EXCAVATION SECTION**

SCALE: 1" = 1'

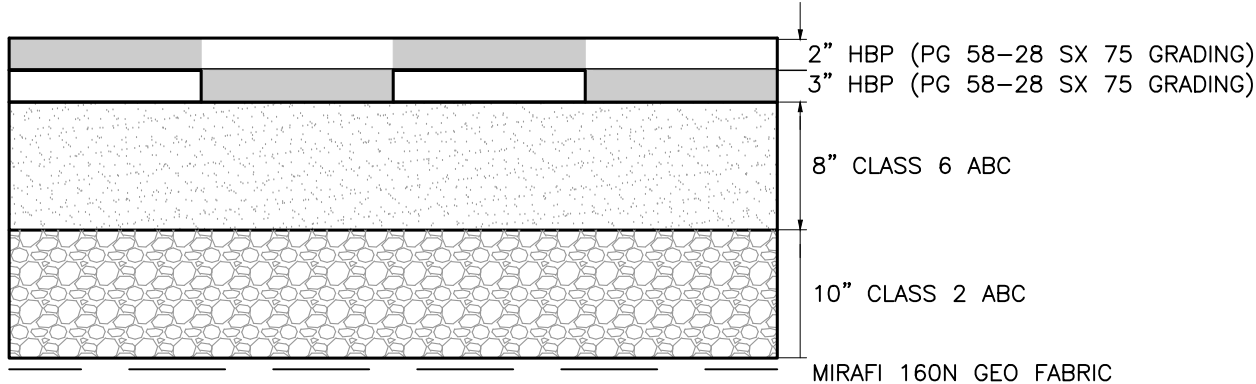


\*NOTE: SCARIFY AND RECOMPACT SUBGRADE 8" DEPTH TO 95% STANDARD OR 90% MODIFIED PROCTOR

WEST MEADOWS DRIVE START TO STA: 38+27.87  
WULFSOHN DRIVE START TO STA: 45+76.61

**HIGH TRAFFIC ASPHALT SECTION**

SCALE: 1" = 1'

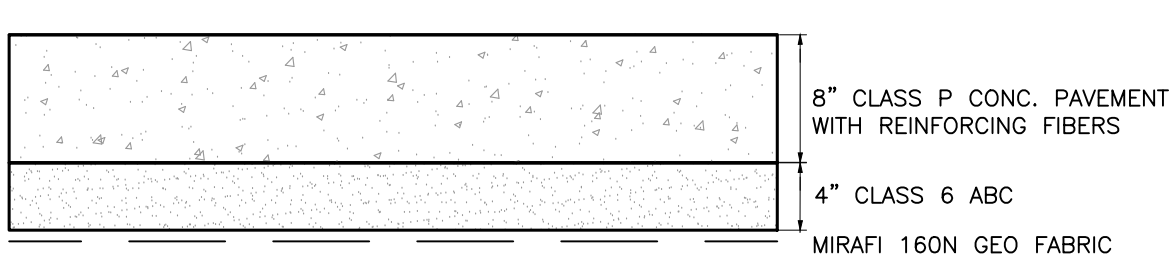


\*NOTE: SCARIFY AND RECOMPACT SUBGRADE 8" DEPTH TO 95% STANDARD OR 90% MODIFIED PROCTOR

EAST MEADOWS DRIVE STA: 12+19.52 TO END

**LOW TRAFFIC ASPHALT SECTION**

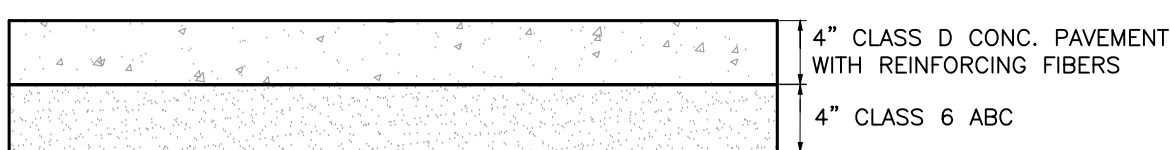
SCALE: 1" = 1'



\*NOTE: SCARIFY AND RECOMPACT SUBGRADE 8" DEPTH TO 95% STANDARD OR 90% MODIFIED PROCTOR

**CONCRETE PAVEMENT SECTION**

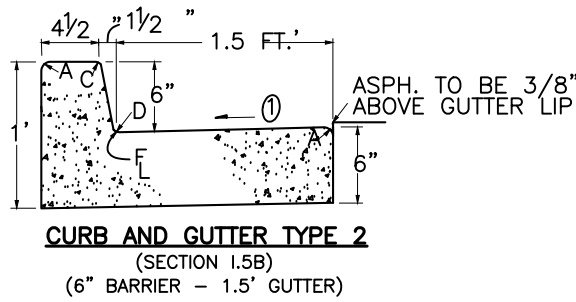
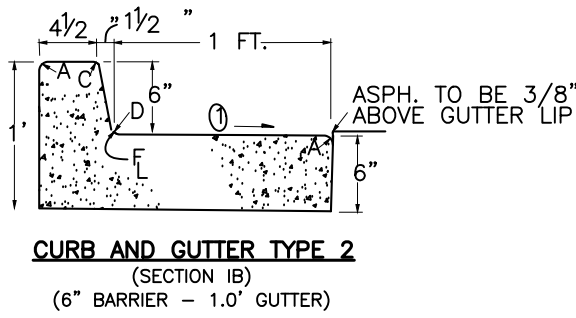
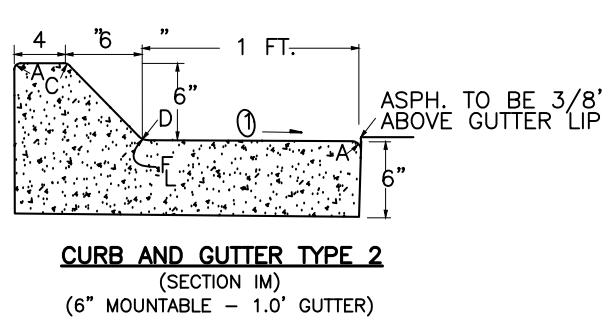
SCALE: 1" = 1'



\*NOTE: SCARIFY AND RECOMPACT SUBGRADE 8" DEPTH TO 95% STANDARD OR 90% MODIFIED PROCTOR

**CONCRETE SIDEWALK SECTION**

SCALE: 1" = 1'

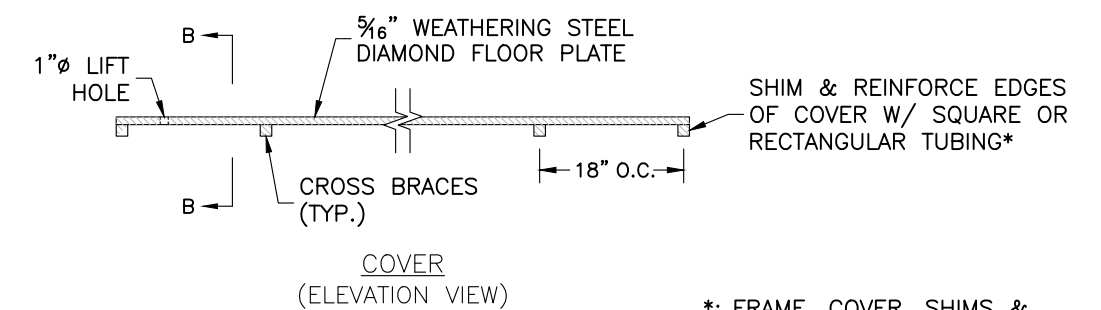
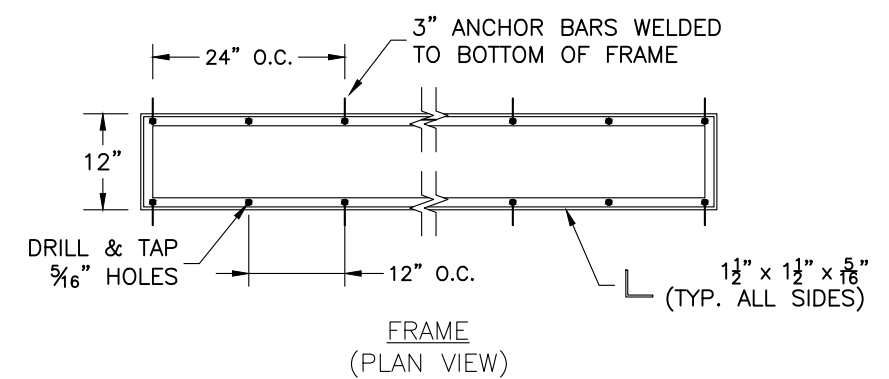
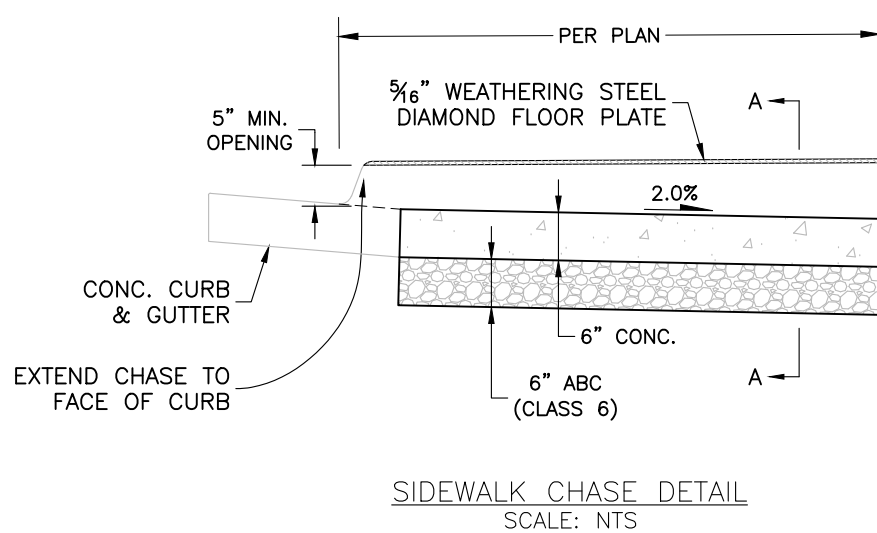
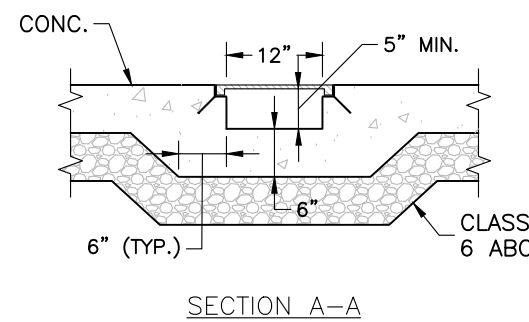
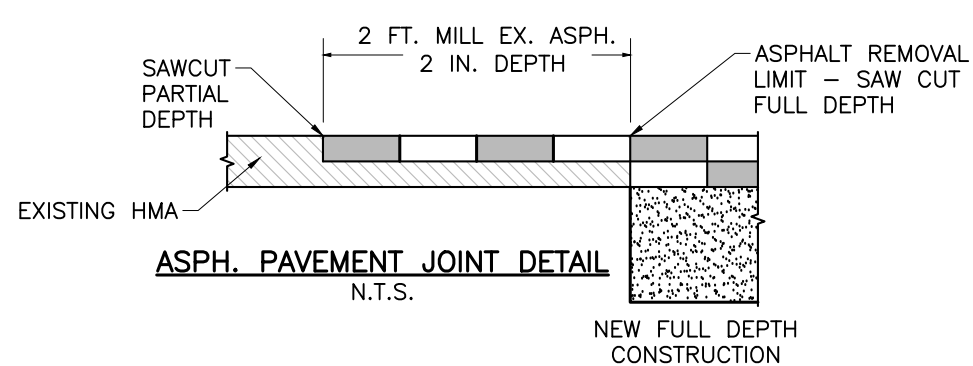


#### LEGEND FOR RADII

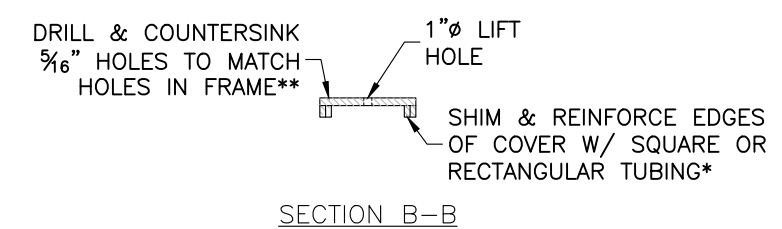
A = 1/8" TO 1/4"  
B = 1"  
C = 1 1/2"  
D = 1 1/2" TO 2"

#### GENERAL NOTES

- ALL SUBBASE IS TO BE SCARIFIED AND COMPACTED PRIOR TO PLACEMENT OF CLASS 6. PROOF ROLL TEST ARE TO BE PERFORMED FOR EACH TRAVEL LANE & PARKING AREAS PRIOR TO PLACEMENT OF CLASS 6 ABC.
  - CONCRETE SHALL BE CLASS D.
  - A MIN. OF 4" CLASS 6 ABC SHALL BE PLACED UNDER CURB & GUTTER SECTIONS.
  - DUMMY JOINTS FOR GUTTER TYPE 2 & CURB & GUTTER ARE TO BE SPACED AT 10 FT. ACCORDING TO CDOT SPEC. 609
- EXPANSION JOINTS SHALL BE INSTALLED WHEN ABUTTING EXISTING CONCRETE OR FIXED STRUCTURE. EXPANSION JOINT MATERIAL SHALL BE 1/2 IN. THICK AND SHALL EXTEND THE FULL DEPTH OF CONTACT SURFACE.
- ① GUTTER CROSS SLOPES SHALL BE 1/2 IN./FT. WHEN DRAINING AWAY FROM CURB AND 1IN./FT. WHEN DRAINING TOWARD CURB.



\*: FRAME, COVER, SHIMS & CROSS BRACING SHALL BE FABRICATED OF STEEL

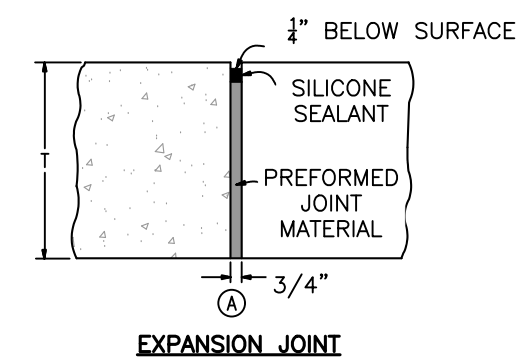


\*\*: FASTEN COVER TO FRAME W/ 1/8" STAINLESS STEEL SCREWS WITH COUNTERSUNK HEAD

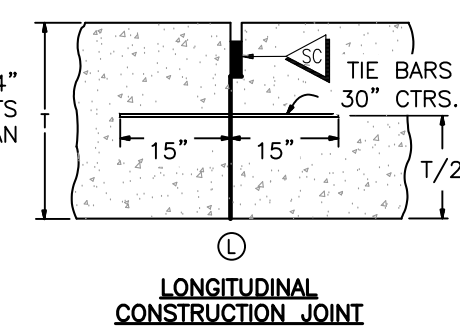
**CHASE DRAIN DETAIL**  
N.T.S.

**NOTE:**

- BARS AND DOWELS TO BE GREASED PRIOR TO SECOND POUR.
- ALL BARS AND DOWELS TO BE EPOXY COATED.

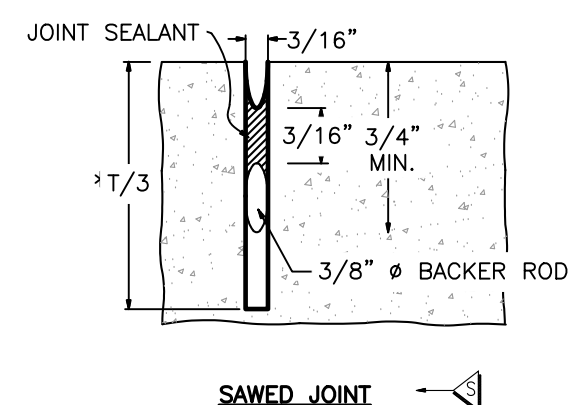
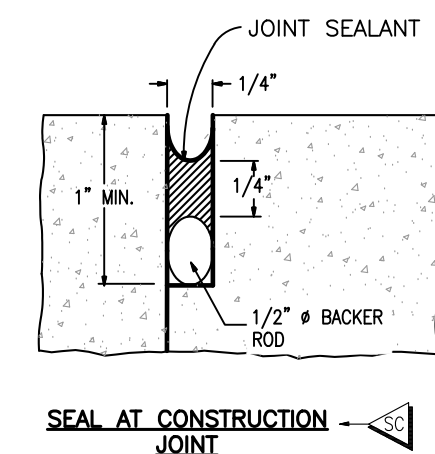
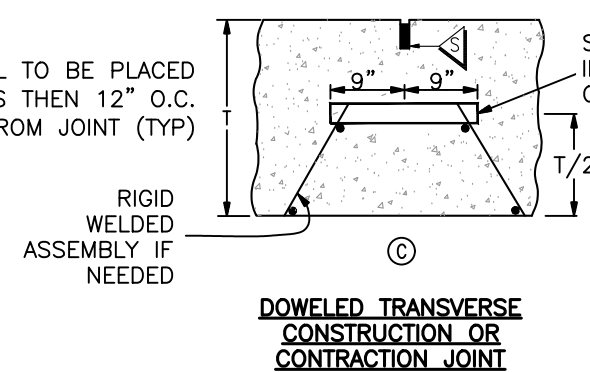


30"x NO.5 TIE BARS TO BE 24" O.C., CENTERED BETWEEN JOINTS AS SHOWN ON PLAN



24"x1" Ø DOWEL TO BE PLACED 6" FORM JOINTS THEN 12" O.C. (3) DOWELS FROM JOINT (TYP)

SEE DOWEL SPACING IN TRAVEL LANES ON PLAN VIEW.





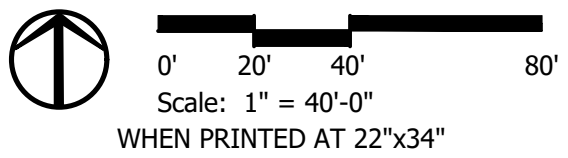
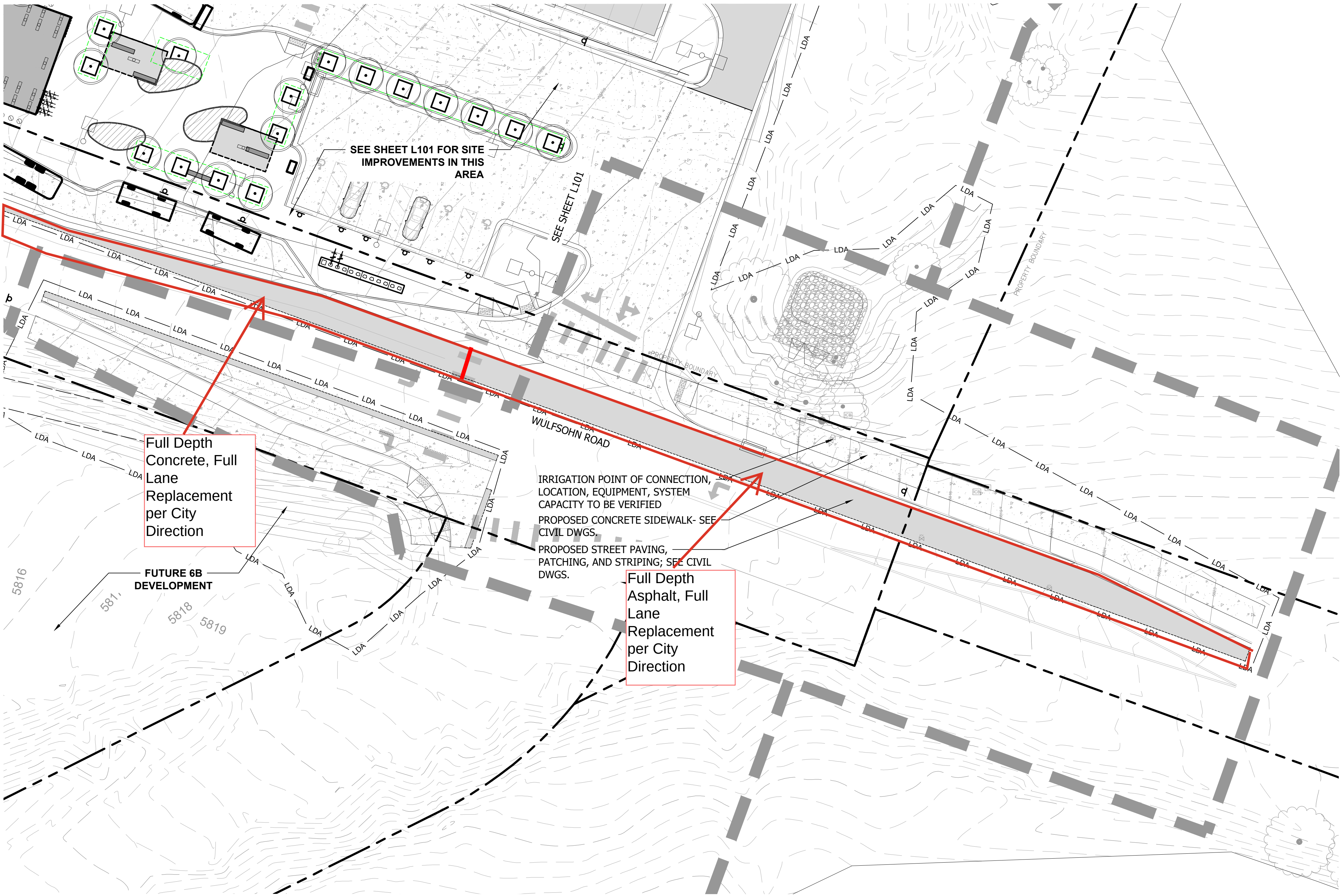
LEGEND

- PROPERTY BOUNDARY
- SHEET MATCHLINE
- EXISTING CONTOURS
- EXISTING TREES TO REMAIN
- PROPOSED SITE WALLS ( SEE CIVIL & STRUCTURAL DWGS.
- PROPOSED BACKLESS BENCH
- PROPOSED TREE GRATE W/ TREE PROTECTION & STRUCTURAL SOIL
- PROPOSED BUS CHARGING STATION (SEE MEP)
- PROPOSED SCREENING FENCE
- PROPOSED SHADE STRUCTURE
- PROPOSED RAISED PLANTER
- PROPOSED SITE LIGHTING (SEE LIGHTING PLANS)
- PROPOSED BEAR-PROOF TRASH AND RECYCLING RECEPTACLE
- PROPOSED BIKE SHARE STATION (SEE CIVIL AND WECYCLE)
- PROPOSED BIKE RACK
- PROPOSED ASPHALT PAVING; SEE CIVIL
- PROPOSED CONCRETE VEHICULAR PAVING; SEE CIVIL
- PROPOSED CONCRETE PEDESTRIAN PAVING; SEE CIVIL
- STRUCTURAL SOIL EXTENTS (SEE PLANTING PLANS & NOTES)

- NOTES:
- 1.SEE CIVIL PLANS FOR ALL GRADING & DRAINAGE.
- 2.PAVEMENT MARKINGS & ADA CURB RAMPS PER CIVIL.

MATERIALS SCHEDULE

| 1.0 | PAVEMENTS           |                                                 |                     |                                           |
|-----|---------------------|-------------------------------------------------|---------------------|-------------------------------------------|
|     | CALLOUT             | ITEM                                            | DETAIL / SHEET      | PRODUCT                                   |
|     | 1.1                 | TYPE 1 - VEHICULAR PAVING                       | PER CIVIL           |                                           |
|     | 1.2                 | TYPE 2 - PED. PAVING CONCRETE(SNOW-MELT)        | PER CIVIL           |                                           |
| 2.0 | WALLS & STAIRS      |                                                 |                     |                                           |
|     | 2.1                 | TYPE 1 - CONCRETE RETAINING WALL                | PER CIVIL           |                                           |
|     | 2.2                 | TYPE 2 - MSE WALL                               | PER CIVIL           |                                           |
|     | 2.3                 | TYPE 1 - CONCRETE STAIR W/ HANDRAIL             | PER CIVIL           |                                           |
| 3.0 | SITE ELEMENTS       |                                                 | DETAIL / SHEET      |                                           |
|     | 3.1                 | BACKLESS BENCH                                  | 1/L304              | Landscape Forms- Socrates                 |
|     | 3.2                 | TREE GRATE W/ TREE PROTECTION & STRUCTURAL SOIL | 2/L304              | Urban Accessories- Jamieson               |
|     | 3.3                 | BIKE RACK (246 SPACES)                          | 3/L304              | Landscape Forms- Key                      |
|     | 3.4                 | BEAR PROOF TRASH RECEPTACLE                     | 5/L304              | BearSaver- HA Series Double Trash Recycle |
|     | 3.5                 | SCREENING FENCE                                 | 4/L304              | 80K Modern- TBD Perforated Metal          |
| 4.0 | PLANTERS & SHELTERS |                                                 |                     |                                           |
|     | 4.1                 | RAISED STEEL PLANTER                            | 1-5/L302 & 1-5/L303 | ORE Planters- Custom Powdercoated         |
|     | 4.2                 | CUSTOM SHADE SHELTER                            | PER ARCH.           |                                           |
|     | 4.3                 | CUSTOM BIKE BARN                                | PER ARCH.           |                                           |



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File Name: 0-23019-SITE-PLAN\_TRANSIT.dwg

Horiz. Scale: As Noted Vert. Scale: As Noted

Short Elliott Hendrickson Inc.  
Colorado Center Tower One  
Suite 6000  
2000 South Colorado Boulevard  
Denver, CO 80222-7900

Tele. (720) 540-6800  
(800) 490-4966  
Fax (720) 540-6801

Sheet Revisions

| Rev. | Date     | Comments             | Init. |
|------|----------|----------------------|-------|
|      | 08/20/24 | LAND USE APPLICATION | LW/SH |
|      |          |                      |       |
|      |          |                      |       |
|      |          |                      |       |

ROARING FORK TRANSPORTATION AUTHORITY  
WEST GLENWOOD TRANSIT CENTER

2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

FIR Plans

No Revisions:

Revised:

Void:

SITE MATERIALS PLAN  
6A SOUTH EAST

Designer:

LW

Detailer:

SH

Sheet Subset:

Subset Sheets: of

Project No./Code

TRG M535-014

25924

Sheet Number L102



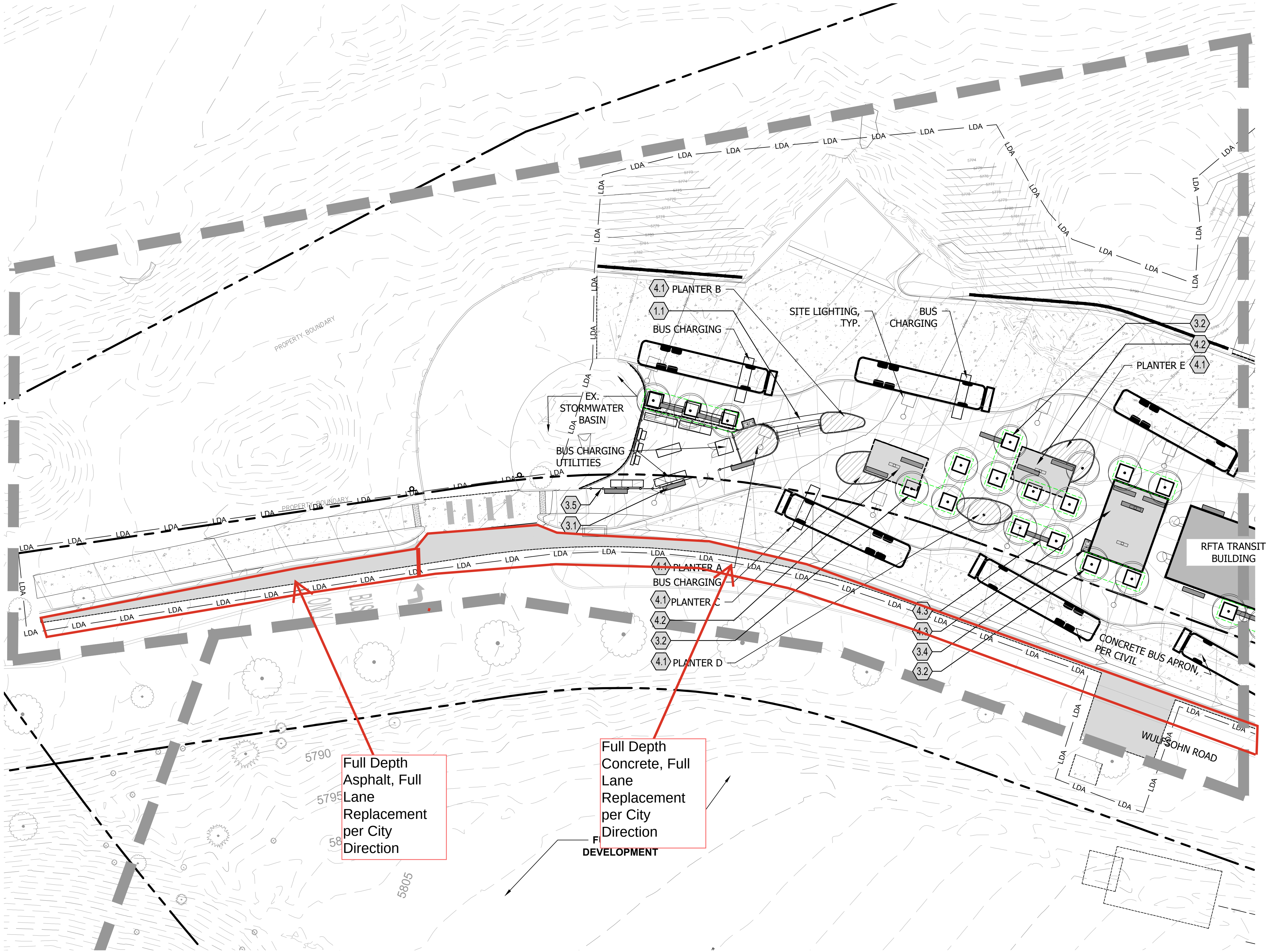
LEGEND

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- SHEET MATCHLINE
- EXISTING CONTOURS
- EXISTING TREES TO REMAIN
- PROPOSED SITE WALLS ( SEE CIVIL & STRUCTURAL DWGS.
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- PROPOSED RAISED PLANTER
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|                 | 08/20/24 | LAND USE APPLICATION | LW/SH |  |
|                 |          |                      |       |  |
|                 |          |                      |       |  |
|                 |          |                      |       |  |

ROARING FORK TRANSPORTATION AUTHORITY

WEST GLENWOOD TRANSIT CENTER

2307 WULFSOHN ROAD  
GLENWOOD SPRINGS, CO 81601

| FIR Plans     |
|---------------|
| No Revisions: |
| Revised:      |
| Void:         |

| SITE MATERIALS PLAN<br>6A WEST |    |                |    |
|--------------------------------|----|----------------|----|
| Designer:                      | LW | Structure      |    |
| Detailer:                      | SH | Numbers        |    |
| Sheet Subset:                  |    | Subset Sheets: | of |

| Project No./Code         |
|--------------------------|
| TRG M535-014             |
| 25924                    |
| Sheet Number <b>L103</b> |





**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** South Bridge Update

**Action Requested:** NA

**Department:** Engineering

**Presented By:** Ryan Gordon

**Strategic Goals:** Preserve and Improve Infrastructure

**Background Info:** Staff will provide council an update on the status and progress of the South Bridge project.

**Issues:** NA

**Fiscal Impact:** NA

**Legal Review:** NA

**Staff Recommendation:** NA





**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

|                              |                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agenda Item:</b>          | Fire Evacuation Presentation                                                                                                                                                                                                                                                                                                                                  |
| <b>Action Requested:</b>     | The City completed its evacuation plan this summer, distributed it through our regular channels and held a public event. As a result of recent wildfire activity in California and a small flare-up near Wal-Mart there has been renewed public interest in the particulars. This is an opportunity to re-highlight the plan and re-promote public awareness. |
| <b>Department:</b>           | City Administration                                                                                                                                                                                                                                                                                                                                           |
| <b>Presented By:</b>         | Joseph Deras, Steve Boyd                                                                                                                                                                                                                                                                                                                                      |
| <b>Strategic Goals:</b>      | Provide Efficient and Responsive City Government<br>Protect and Preserve our Quality of Life<br>Ensure Public Safety                                                                                                                                                                                                                                          |
| <b>Background Info:</b>      | Provide Council with an abridged update on the adopted evacuation plan. Initial plan adopted by Council in 2024.                                                                                                                                                                                                                                              |
| <b>Issues:</b>               | As fire season approaches and after several high profile fires on the west coast, an update on the city plan, access to the plan and steps moving forward.                                                                                                                                                                                                    |
| <b>Fiscal Impact:</b>        | NA                                                                                                                                                                                                                                                                                                                                                            |
| <b>Legal Review:</b>         | NA                                                                                                                                                                                                                                                                                                                                                            |
| <b>Staff Recommendation:</b> | NA                                                                                                                                                                                                                                                                                                                                                            |

# Glenwood Springs

## Emergency Operations / Traffic Emergency Management Plan



Prepared for:

City of Glenwood Springs

Prepared by:



If you are having issues accessing any portion of the content or functionality of this document, please contact us at [ADAteam@cogs.us](mailto:ADAteam@cogs.us) or 970-384-6441.

November 2023

Packet Page 1809

## Adoption

This document provides guidance for implementing the City of Glenwood Springs Emergency Operations/ Traffic Emergency Management Plan in coordination with other Garfield County emergency plans as well as the City of Glenwood Springs supporting policies, procedures, operational guidelines, and processes. The City of Glenwood Springs has adopted the Garfield County Emergency Operations Plan (2015) and the Garfield County Traffic Incident Management Plan (2022). Copies of these documents and all supporting appendices are available by contacting the City of Glenwood Springs.

## Document Development and Acknowledgements:

This document was developed for the City of Glenwood Springs. The Emergency Operations/ Traffic Emergency Management Plan is a collaborative community effort among several multi-disciplinary agencies and organizations. The following organizations participated in the development of this plan:

- Glenwood Springs City Administration
- Glenwood Springs Fire Department
- Glenwood Springs Police Department
- Glenwood Springs Parks and Recreation Department
- Glenwood Springs Public Works
- Garfield County Sheriff's Office
- Garfield County Emergency Communications Authority
- Colorado State Patrol
- Colorado Department of Transportation
- RE-1 School District
- Colorado Mountain College
- St. Stephen Catholic School
- Yampa Mountain High School
- Two Rivers Community School
- Valley View Hospital
- Sunnyside Retirement Center
- Mountain Valley Developmental Services
- Roaring Fork Senior Living
- Colorado Parks and Wildlife
- Glenwood Springs Chamber Resort Association
- Union Pacific Railroad
- Roaring Fork Transportation Authority
- Glenwood Springs Adventure Park
- Glenwood Springs Health Care
- Garfield County Public Health



## Plan Maintenance, Revision, and Distribution

Ownership of the plan will be the responsibility of the City Manager. The advisory council consisting of the City Manager, Fire Chief, Deputy Fire Chief, and Police Chief will be responsible for the maintenance, revisions, and distribution of the plan. The plan will be reviewed annually by the advisory council and undergo a full stakeholder review every five years. The reviews may result in amendments to the plan based on input received from a range of stakeholders, including the City of Glenwood Springs staff, state and county partner agencies, and the community.

## Record of Maintenance and Revision

The City Manager will coordinate the maintenance and revisions of the plan. Review and updates of specific portions of the plan will be accomplished by key staff members/agencies with the best knowledge of the subject matter.

| Date | Part Affected | Summary of Activity | Entry Made By |
|------|---------------|---------------------|---------------|
|      |               |                     |               |
|      |               |                     |               |
|      |               |                     |               |
|      |               |                     |               |

**Certification of Annual Review**

This Emergency Operations/ Traffic Emergency Management Plan has been reviewed by the advisory council consisting of the City Manager, Fire Chief, Deputy Fire Chief, and the Police Chief, and is signed off by the City Manager.

| Date | Signature |
|------|-----------|
|      |           |
|      |           |
|      |           |
|      |           |
|      |           |

## Glenwood Springs Emergency Operations/ Traffic Emergency Management Plan

### Distribution List

This plan and its supporting material are controlled documents and are not open to the public in its entirety. Distribution is based upon a regulatory or functional “need to know” basis. Copies of this plan will be given to those approved agencies/departments. The master “Official” plan will be maintained by the City Manager.

| Office/Department | Name or Recipient | Plan Date | Date Received |
|-------------------|-------------------|-----------|---------------|
|                   |                   |           |               |
|                   |                   |           |               |
|                   |                   |           |               |
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|                   |                   |           |               |

## Approval and Implementation

The ability to respond to a man-made or natural disaster is a necessary function of government. Common to all emergency situations are functions that require the protection of life and property. Specifically, these functions include planning, the identification of responsibilities, various warnings, evacuations, communication, traffic management, direction and control of resources, public information, resource management, damage assessment, and sheltering.

The Emergency Operation/ Traffic Emergency Management plan provides direction and guidance for all hazard responses to deal with the many complexities during an emergency event.

This plan supersedes all previous plans.

Date this \_\_\_\_\_ Day of \_\_\_\_\_, 2023

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City Manager



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## EXECUTIVE SUMMARY

The City of Glenwood Springs has experienced several natural and human-caused disasters and emergencies requiring action from all first responders and support personnel within the boundaries of the Glenwood Springs Rural Fire Protection District. As a result of these emergency/disaster situations, the Glenwood Springs community and those traveling to and through Glenwood Springs are significantly impacted. The traffic volume, specifically during the morning and evening work rush, becomes an issue not only for the community but for first responders answering calls for service. With the significant history of wildfire, requiring the evacuation of the city and areas within the boundaries of the Glenwood Springs Fire Department, an emergency operations plan will serve as a benefit to everyone affected.

The Glenwood Springs Emergency Operations/ Traffic Emergency Management plan focuses on an all-hazards recognition and approach to natural and human-caused disasters/emergencies. This plan was developed to work in harmony with other existing emergency management/operations plans that are active in this area while under the guidelines and principles of the Federal Emergency Management Agency's (FEMA) National Incident Management System (NIMS) model. These guidelines and principles help responders work together to respond, mitigate, and recover from a variety of hazards. The guidelines include Incident Command/Unified Command to help manage authority roles, management structure, communication, procedures, and many other aspects when dealing with an incident.

During the development of the Glenwood Springs Emergency Operations/ Traffic Emergency Management plan several stakeholder groups were identified as part of a whole community approach. Through the stakeholder engagement process, various government agencies and community groups added value with their input. This input generated perspective surrounding past significant emergency events, collaboration on preparation and response, insight on how the City of Glenwood Springs can assist during a crisis, and how stakeholders can assist the city.

Through the stakeholder engagement process, hazards surrounding the identified footprint of this plan were identified as:

- Wildfire
- Flood
- Landslide, Mud/Debris Flow, and Rockfall
- Bridge Compromised
- Hazardous Materials Release
- Severe Winter Weather
- Major Traffic Crash, Aircraft Incident
- Violent Acts - Civil Disturbance
- Power Surges / Outages
- Structure Fire
- Train Derailments

As a result of these identified hazards, a response plan was developed with a concept of operations which outlines roles and responsibilities by agency and discipline. Communication amongst all agencies is a key function of response and coordination, so two communication

plans were developed to enable all responders to communicate more effectively and efficiently. One communication plan is for the interoperability of all responders in Glenwood Springs and Garfield County, while the other is an operability plan for primarily Glenwood Springs responders and resources.

Incident notification, response, and mitigation for an all-hazards approach can affect traffic in various ways. Since the Garfield County Traffic Incident Management Plan (2022) provides guidance surrounding traffic-related emergencies along I-70 and State Highway (SH) 82, all responders should refer to that plan for guidance.

Through the stakeholder engagement process, traffic management during emergency events was a present factor in the planning process. As a result, the plan identifies and maps out critical intersections, critical facilities, areas of refuge/safe zones, human shelters, animal shelters, passenger and commercial motor vehicle storage locations, evacuation routes, and evacuation zones. Evacuation routes consist of US 6, Donegan Road, Storm King Road, Mel Ray Road, East 6<sup>th</sup> Street, Midland Avenue, 8<sup>th</sup> Street, Grand Avenue (SH 82), South Glen Avenue (SH 82), 27<sup>th</sup> Street, 3-Mile Road (GCR 127), 4-Mile Road (GCR 117), and Dry Park Road (GCR 125). The I-70 emergency access line breaks will be a key factor, and a procedure has been developed to utilize the access line breaks once constructed.

During the planning process, 68 evacuation zones (GWS 7001 - GWS 7068) were identified, mapped out, and labeled from the west to the east. These evacuation zones all have a primary evacuation route with alternate routes available for the Incident Command to consider. An evacuation guide was also developed for responders which combines selected evacuation zones with pre-identified evacuation routes. Key traffic control locations, the placement of personnel, and recommended traffic control devices supplement the evacuation guide. The identified traffic control locations can also apply to other emergencies that affect traffic.

Public communication/notification was also recognized as an important factor during emergency situations. By utilizing a combination of emergency notification alerts from the Garfield County Emergency Communications Authority, the City of Glenwood Springs Public Information Officer, the Colorado Department of Transportation's messaging tools, and the Colorado State Patrol's Montrose Regional Communication Center, public information and messaging will be able to reach the population affected by an emergency.

Area schools, assisted living facilities, and other vulnerable population stakeholders contributed and provided details on their facility's processes during an emergency. This plan provides valuable personnel contact and facility information for area schools, assisted living facilities, and Valley View Hospital. Garfield County Public Health will be able to assist the City of Glenwood Springs in identifying and listing vulnerable people who may need assistance during an emergency.

The Glenwood Springs Emergency Operations / Traffic Emergency Management plan is subject to annual reviews, revision when required, and a full stakeholder review every five years. It is approved and implemented by the city manager who will also be the authority for its distribution. This a living document, subject to change and revisions to best serve the community of Glenwood Springs, emergency responders, and all people who visit to enjoy the amenities surrounding Glenwood Springs.

## 1 INTRODUCTION

The Glenwood Springs Emergency Operations/ Traffic Emergency Management Plan operates on the principle that local government bears the initial responsibility for response to an emergency. As a product of this principle, each level of government will accomplish the functions for which it is statutorily responsible and will coordinate response and activities with other entities using the National Incident Management System model of Unified Command.

The City of Glenwood Springs and surrounding communities face a number of hazards and public safety threats that affect the safety and mobility of emergency responders and all roadway users. These hazards may also require the movement or evacuation of people out of a dangerous or closed area or roadway. The safe evacuation and protection of people and the movement of traffic can be complex and requires planning, communication, commitment, and cooperation of several responder agencies and organizations.

Due to the location and geography of Glenwood Springs, there are only three major ingress and egress routes for all roadway users utilizing Interstate 70 (I-70) and State Highway 82 (SH 82). There are two canyons that access Glenwood Springs from East to West that have no notable alternate routes. SH 82 is also problematic, as it is closed during the winter months over Independence Pass. Compounding the situation is Glenwood Springs's seasonal population variation and that it is the center hub for all commuter traffic to other popular tourist communities as well as the work force supporting those communities.

## 2 PURPOSE

Major traffic emergencies and natural disasters are unique events that present communities and emergency personnel with extraordinary problems and challenges that cannot be adequately addressed within the routine operations of local government. The purpose of this plan is an all-hazard approach that provides guidance for all responders to those emergencies which includes the management of traffic that requires restricted access and/or evacuation of the City of Glenwood Springs and within the District of the Glenwood Springs Fire Department (GSFD).

Since disasters differ in important ways and it is impossible to plan for every contingency, highly detailed operational procedures are avoided in the plan in favor of a streamlined all-hazard preparedness approach. This plan is intended to provide city officials and participating agencies with the basis for the coordinated management of major incidents so that impacts are minimized to people, property, public services, and the economy. The goal is to restore normal community conditions as quickly as possible.

This plan also documents operational strategies to carry out the safe and effective movement of traffic in and around Glenwood Springs during a public safety emergency. It identifies shelters and other resources owned and operated by participating agencies.

The plan details significant public safety emergencies and defines roles and responsibilities during an emergency traffic management situation. It builds on the coordination and support of other emergency plans and various public safety agencies. It is focused on an all-hazard



framework for incident response, notification, traffic management, evacuation, sheltering, and re-entry from the whole community perspective. It details anticipated evacuation guidelines, needs, and progression during an emergency event. This plan identifies and provides protocols for alternate and evacuation routes, key traffic management locations, vehicular and staging areas, communication (responder/community), safe zones/areas of refuge/shelters, and post-incident protocols.

## 2.1 Scope and Applicability

This plan will apply to all participating agencies and departments within the geographical boundaries of the Glenwood Springs Fire Department. **Figure 1** shows the plan boundaries in **2.6**. This is an all-hazards approach to coordinate efforts for emergency operations and traffic management from a multi-discipline perspective. The plan is designed to be used in conjunction with the Garfield County Emergency Operations Plan and the Garfield County Traffic Incident Management Plan.

## 2.2 Authority

C.R.S. § 24-33.5-709 empowers local governments to declare a "local disaster." Upon that declaration, the response and recovery aspects of any and all local and interjurisdictional disaster emergency plans are activated.

C.R.S. § 30-10-512; the sheriff of every county, in addition to other duties, shall act as fire warden of his or her respective county and is responsible for the coordination of fire suppression efforts in case of prairie, forest, or wildland fires or wildfires occurring in the unincorporated area of the county outside the boundaries of a fire protection district or that exceed the capabilities of the fire protection district to control or extinguish.

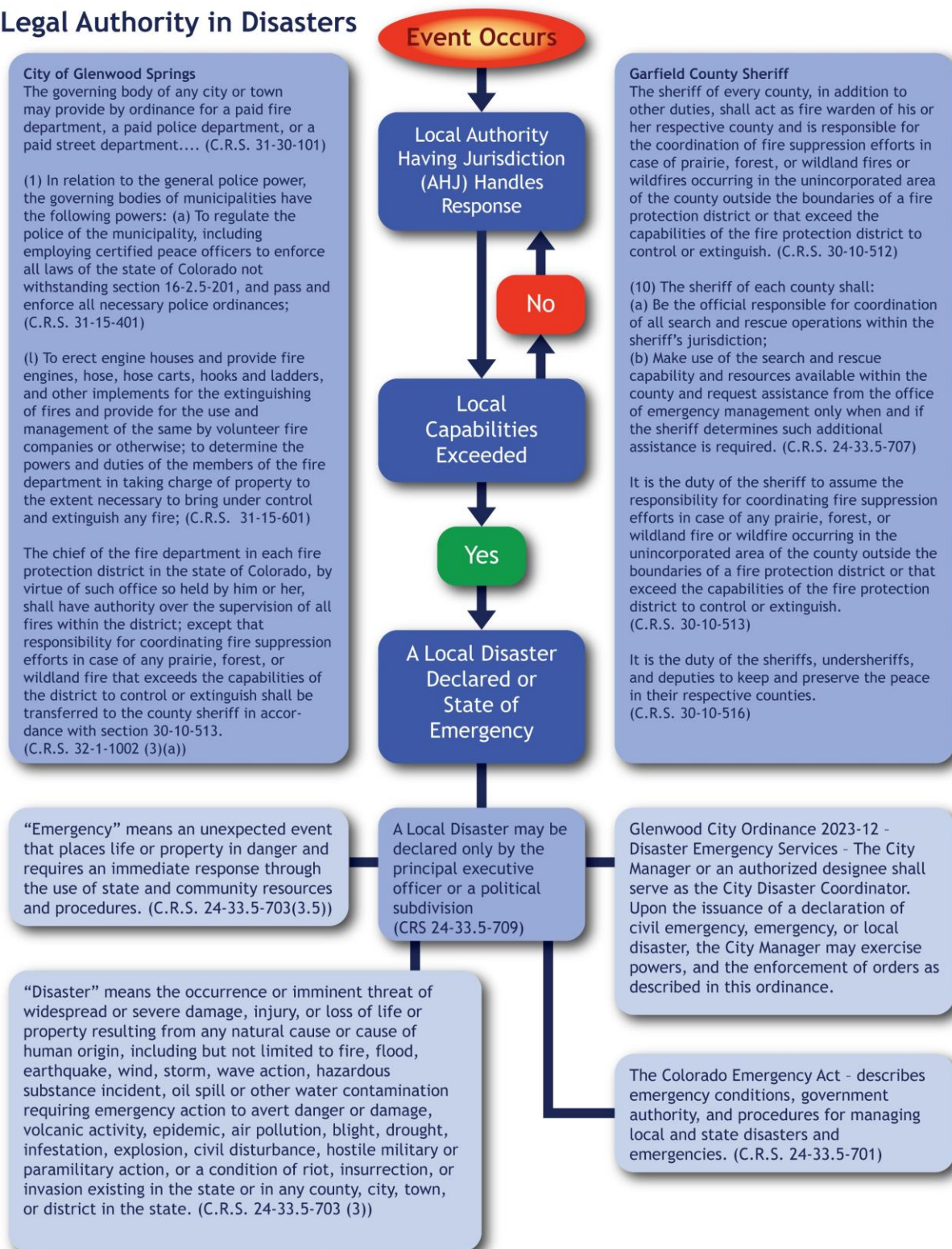
### C.R.S § 24-33.5-703 Definitions

(3) "Disaster" means the occurrence or imminent threat of widespread or severe damage, injury, or loss of life or property resulting from any natural cause or cause of human origin, including but not limited to fire, flood, earthquake, wind, storm, wave action, hazardous substance incident, oil spill or other water contamination requiring emergency action to avert danger or damage, volcanic activity, epidemic, air pollution, blight, drought, infestation, explosion, civil disturbance, hostile military or paramilitary action, or a condition of riot, insurrection, or invasion existing in the state or in any county, city, town, or district in the state.

(3.5) "Emergency" means an unexpected event that places life or property in danger and requires an immediate response through the use of state and community resources and procedures.

The City of Glenwood City Ordinance 2023-12 - Disaster Emergency Services; The City Manager or an authorized designee shall serve as the City Disaster Coordinator. Upon the issuance of a declaration of civil emergency, emergency, or local disaster, the City Manager may exercise powers, and the enforcement of orders as described in this ordinance.

## Legal Authority in Disasters



**Figure 1. Legal Authority for Disasters**

## 2.3 Situation Overview

Due to the location and geography of Glenwood Springs, there are only three major ingress and egress routes for all roadway users utilizing I-70 and SH 82. I-70 is a designated hazardous material route and there is an active rail line that travels through the city. There are two canyons that access Glenwood Springs from East to West that have no notable alternate route. SH 82 is also problematic, as it is closed during the winter months over Independence Pass. The residential population of the city and surrounding area increases according to season and time of day. According to the Glenwood Springs Chamber Resort Association, and based on monthly lodging tax figures, the seasonal population increases during the months of June - September. [TRENDS ONLINE 2022 Year End Issue \(growthzoneapp.com\)](https://www.growthzoneapp.com). Additionally, traffic in Glenwood Springs fluctuates depending on the time of day and day of week, however, during the morning rush (5:00am-10:00am) 45% of traffic passes through Glenwood Springs and 45% are traveling to Glenwood from outside the community. During the evening rush (2:00pm-7:00pm) 37% of traffic passes through Glenwood while 44% travel to Glenwood. This information was provided by the City of Glenwood Springs (COGS) Transportation Study Update, February 2023.

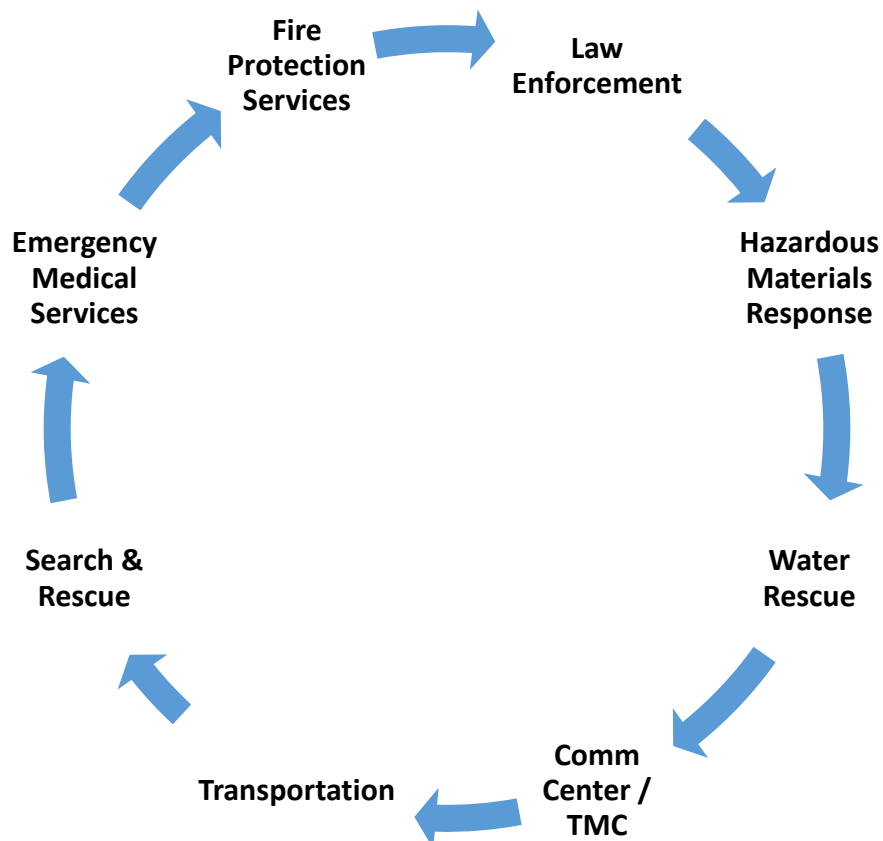
Glenwood Springs has a significant wildfire history. From 1994-2020, eleven wildfires destroyed 47,341 acres, 33 ¾ structures, and took the lives of 14 fire fighters. Additionally, I-70 often gets closed, through Glenwood Canyon and South Canyon, due to a variety of circumstances. There are no continuous adjacent alternate routes along I-70 for motorists and roadway users. SH 82 runs South out of Glenwood Springs and is the direct route to the Towns of Carbondale, El Jebel, Basalt, and the Cities of Snowmass Village and Aspen. Along SH 82 there are many steep hillsides prone to mud/rockslides. During the winter months (Nov. - May), SH 82 through Glenwood Springs serves as the only direct route to those communities.

## 2.4 Geography

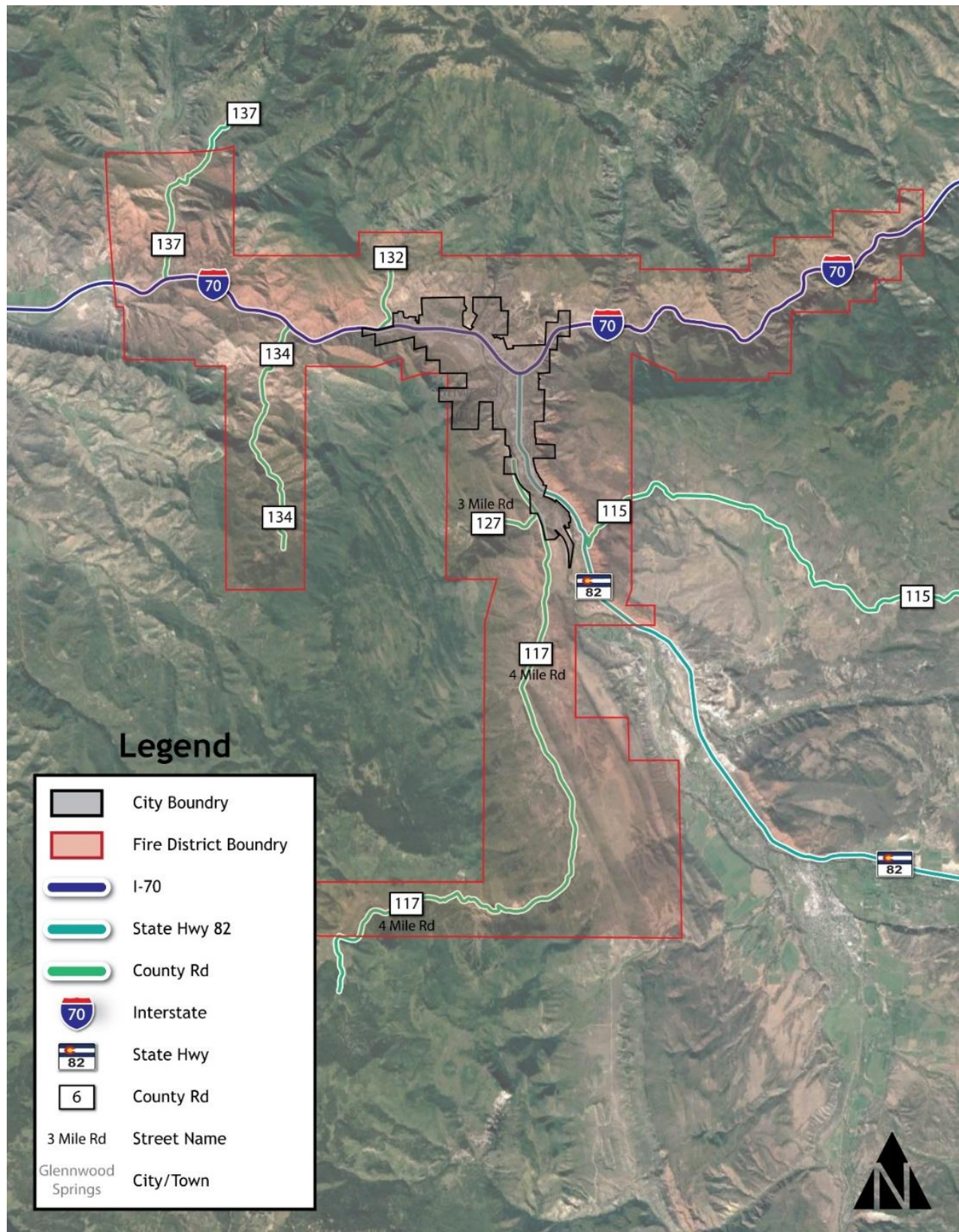
The City of Glenwood Springs covers approximately eight square miles and has a population of 11,013 in 2023 based on the 2020 census with an annual increase of 3.27% based on [Colorado Cities by Population \(2023\) \(worldpopulationreview.com\)](https://www.worldpopulationreview.com). The Glenwood Springs Fire Department (GSFD) covers 72 square miles. The GSFD coverage area encompasses approximately 16,000 residents, with just over 11,000 residents within the City of Glenwood Springs. The seasonal (Summer) population increases by 30-40 percent as visitors arrive to enjoy the amenities of Glenwood Springs. The coverage area includes public land (Bureau of Land Management, United States Forest Service, Garfield County, Glenwood Springs, etc.) as well as private land, see **Figure 2** for details. Within the boundaries of the Glenwood Fire Department, many jurisdictions operate to save lives and property. All the jurisdictions that operate in this area rely on mutual and automatic aid support when needed and requested. Some jurisdictions have an Memorandum of Understanding (MOU) in place while others are defined in other emergency plans. **Table 1** is a list of emergency disciplines & agencies.

**Table 1. Emergency Discipline & Agency**

|                                   |                                                         |
|-----------------------------------|---------------------------------------------------------|
| <b>Fire Protection Services</b>   | <b>Law Enforcement</b>                                  |
| Glenwood Springs Fire Department  | Glenwood Springs Police Department                      |
|                                   | Garfield County Sheriff's Office                        |
| <b>Emergency Medical Services</b> | Colorado State Patrol                                   |
| Glenwood Springs Fire Department  |                                                         |
|                                   | <b>Hazardous Materials Response</b>                     |
| <b>Search and Rescue</b>          | Glenwood Springs Fire Department                        |
| Garfield County Sheriff's Office  | Colorado State Patrol                                   |
| Glenwood Springs Fire Department  | Garfield County Sheriff's Office                        |
|                                   |                                                         |
| <b>Transportation</b>             | <b>Water Rescue</b>                                     |
| Glenwood Springs Public Works     | Glenwood Springs Fire Department                        |
| Garfield County Road & Bridge     | Garfield County Sheriff's Office                        |
| CDOT - Hanging Lake Tunnel        |                                                         |
| Roaring Fork Transit Authority    | <b>Communication Center / Traffic Management Center</b> |
| RE-1 School District              | Garfield County Emergency Communication Authority       |
| Glenwood Adventure Company        | Montrose Regional Communication Center - CSP            |
| Blue Sky Adventures               | Hanging Lake Tunnel TMC - CDOT                          |







**Figure 2. Glenwood Springs Fire and City Boundaries**

## 2.5 Prior Actions

Prior actions taken by the City of Glenwood Springs and other stakeholder agencies to minimize an incident's impacts on the area are:

- Two Access Line Breaks are to be built to access I-70 from Storm King Road and West 1<sup>st</sup> Street.
- A planned and designed second bridge to manage traffic from the southern end of the city to help serve communities on 4-Mile Road, 3-Mile Road, and South Glenwood Springs.
- The Garfield County Traffic Incident Management Plan was developed to assist emergency responders in all traffic-related emergencies.

## 2.6 Hazard Profile

The Garfield County Hazard Mitigation Plan evaluated a range of natural and man-made hazards that pose a risk to the county and communities. During the planning process, the local planning team identified specific hazards of top concern for the Glenwood Springs Fire Department (GSFD) which required a more nuanced and in-depth discussion of local events, vulnerabilities, and mitigation actions. These are the top four hazard concerns identified by the GSFD local planning team.

- Wildfire
- Flood
- Severe Winter Weather
- Hazardous Materials

Hazardous conditions can result from a number of human-caused incidents and natural phenomena. Based on stakeholder input these are additional hazards that were presented:

- Structure Fire
- Rock and Mud Slides
- Civil Disturbances
- Train Derailments
- Power Outages

As a result of all the information provided a Table of Hazards was created, see **Table 2**.

**Table 2. Table of Hazards**

| Hazard Category | Action and challenges                                                                                                                                                                                                 | Areas of Concern                                                                                                                                                                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wildfire        | Operational Coordination and Communication<br>Additional Resources<br>Traffic Management<br>Fire Management and Suppression<br>Shelter-in-Place / Evacuation / Security<br>Shelters<br>Public Information - Messaging | <b>Very high/extreme risk:</b> Highlands, North No Name, Midland, Canyon Creek Estates, Mer Ray/Shady Acres, Chelyn Acres, Upper Canyon Creek, Upper Mitchell Creek, Oasis Creek, Sunlight View I, Black Diamond, Mountain Springs Ranch, East Glenwood, Three Mile, Oak Meadows, and Lower Canyon Creek |
| Flood           | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Shelter-in-Place / Evacuation / Security<br>Shelters<br>Public Information - Messaging                            | Three Mile Creek culvert, Mitchell Creek floodplain, east side debris basins, River Meadows mobile home park located on the Roaring Fork River, main water supply for the city is piped over the Colorado River, 7th St interchange, Veltus Park                                                         |

| Hazard Category                                  | Action and challenges                                                                                                                                                                                                                      | Areas of Concern                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Landslide, Mud/Debris Flow, and Rockfall         | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Shelter-in-Place / Evacuation / Security<br>Shelter<br>Public Information - Messaging                                                  | Interstate 70 (I-70), Midland Avenue, State Highway 82 (SH 82), and US Highway 6, The Meadows area, Debris flows are possible on all portions of the city                                                                                                                                                                                                               |
| Bridge Compromised                               | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Engineering<br>Alternate Routes<br>Public Information - Messaging                                                                      | <b>Vehicular Bridges</b> - Midland, Grand Ave., 8th St., 27th St., & Devereux.<br><b>Pedestrian Bridges</b> - Two Rivers, Mitchell Creek, 14th St., 27th St. Old Cardiff, 3 Mile Creek (2)<br><b>None Flood Bridges</b> - Midland Ped Bridge over Midland Avenue, 120 Midland Avenue area, Devereux Bridge over I-70, UPRR Bridge over Midland, 120 Midland Avenue area |
| Hazardous Material Release                       | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Fire Management and Suppression<br>Shelter-in-Place Evacuation / Security<br>Shelters<br>Public Information - Messaging                | I-70 and the rail line, various storage sites throughout the city                                                                                                                                                                                                                                                                                                       |
| Severe Winter / Summer Weather                   | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Shelters (Heating/Cooling)                                                                                                             | The entire population can be impacted                                                                                                                                                                                                                                                                                                                                   |
| Major Traffic Crash, Major Aircraft Incident     | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Public Information - Messaging                                                                                                         | I-70, US 6, and SH 82                                                                                                                                                                                                                                                                                                                                                   |
| Violent Acts - Civil Disturbance, Active Shooter | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Shelter-in-Place / Evacuation / Security<br>Shelters<br>Public Information - Messaging                                                 | Glenwood Springs Critical Facilities, Valley View Hospital, and assisted living facilities                                                                                                                                                                                                                                                                              |
| Power Surges / Outages                           | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Shelter-in-Place / Evacuation / Security<br>Shelters<br>Public Information - Messaging                                                 | Glenwood Springs Critical Facilities, Valley View Hospital, and assisted living facilities                                                                                                                                                                                                                                                                              |
| Train Derailment                                 | Operational Coordination and Communication<br>Additional Resource Requests<br>Traffic Management<br>Fire Management and Suppression<br>Shelter-in-Place / Evacuation / Security<br>Shelters<br>Mass Care<br>Public Information - Messaging | Rail line, I-70, US 6, Midland Ave corridors                                                                                                                                                                                                                                                                                                                            |



### Table 3. Glenwood Springs Critical Facilities and Exposure to Hazards

| #  | Name                                    | Generator | Floodplain | Dam Inundation | Wildfire Hazards | Geologic Hazards |
|----|-----------------------------------------|-----------|------------|----------------|------------------|------------------|
| 1  | Steamboat Springs High School           | Yes       | Yes        | Yes            | Yes              | Yes              |
| 2  | Steamboat Springs Middle School         | Yes       | Yes        | Yes            | Yes              | Yes              |
| 3  | Steamboat Springs Elementary School     | No        | No         | No             | Yes              | Yes              |
| 4  | Steamboat Springs Community Center      | No        | No         | No             | Yes              | Yes              |
| 5  | Steamboat Springs Library               | Yes       | Yes        | Yes            | Yes              | Yes              |
| 6  | Steamboat Springs Police Station        | No        | No         | No             | Yes              | Yes              |
| 7  | Steamboat Springs Fire Station          | No        | No         | No             | Yes              | Yes              |
| 8  | Steamboat Springs Town Hall             | No        | No         | No             | Yes              | Yes              |
| 9  | Steamboat Springs Hospital              | No        | No         | No             | Yes              | Yes              |
| 10 | Steamboat Springs Senior Center         | No        | No         | No             | Yes              | Yes              |
| 11 | Steamboat Springs Cemetery              | No        | No         | No             | Yes              | Yes              |
| 12 | Steamboat Springs Water Treatment Plant | No        | No         | No             | Yes              | Yes              |
| 13 | Steamboat Springs Sewer Treatment Plant | No        | No         | No             | Yes              | Yes              |
| 14 | Steamboat Springs Gas Station           | No        | No         | No             | Yes              | Yes              |
| 15 | Steamboat Springs Grocery Store         | No        | No         | No             | Yes              | Yes              |
| 16 | Steamboat Springs Pharmacy              | No        | No         | No             | Yes              | Yes              |
| 17 | Steamboat Springs Post Office           | No        | No         | No             | Yes              | Yes              |
| 18 | Steamboat Springs Fire Station          | No        | No         | No             | Yes              | Yes              |
| 19 | Steamboat Springs Police Station        | No        | No         | No             | Yes              | Yes              |
| 20 | Steamboat Springs Town Hall             | No        | No         | No             | Yes              | Yes              |

[illegible]

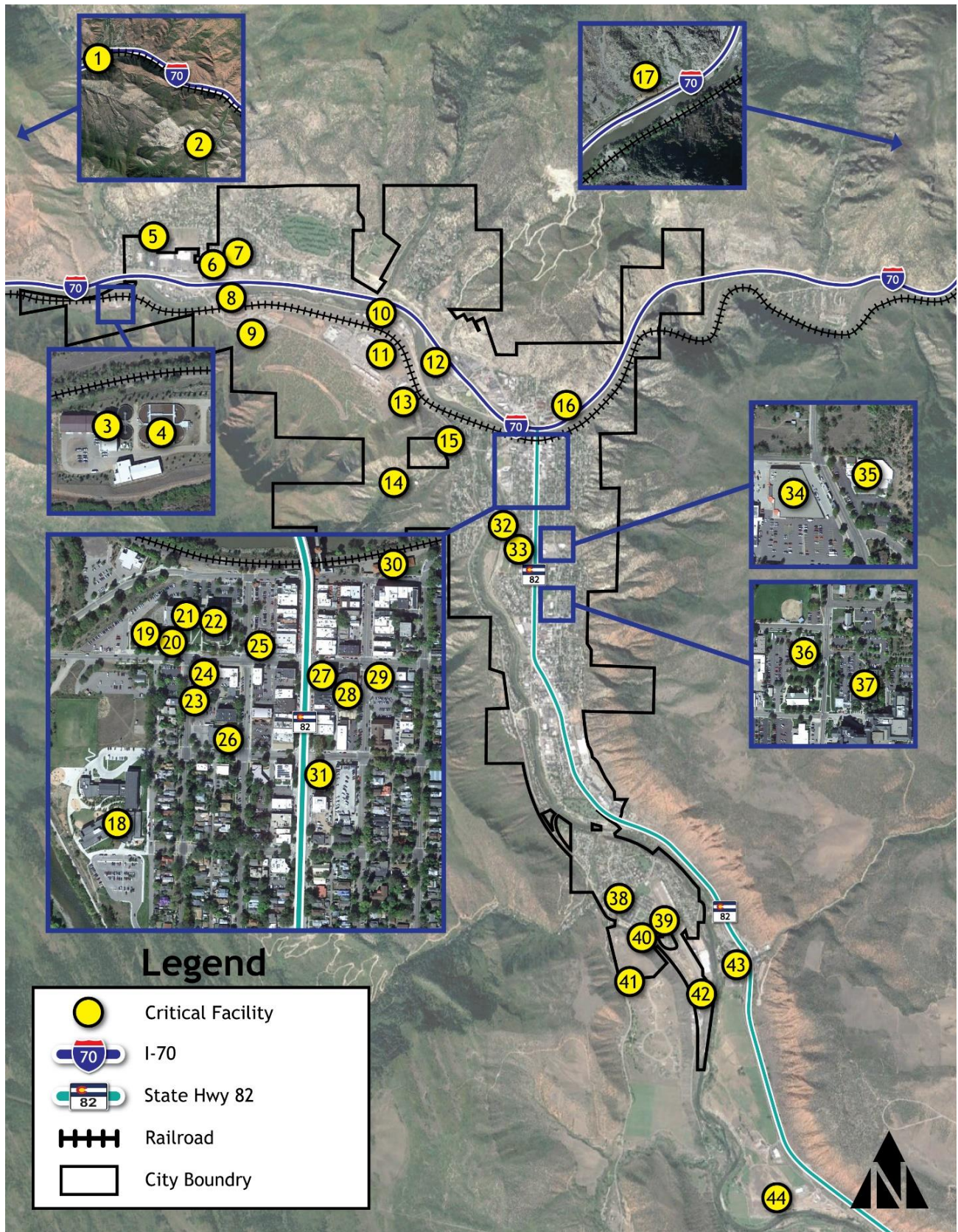


Figure 3. Glenwood Springs Critical Facilities



## 2.7 Assumptions

Response operations will be managed according to the Incident Command System (ICS) and National Incident Management System (NIMS) principles. This plan uses these principles to coordinate actions with other response and recovery functions.

Depending on the size, location, and scope of an evacuation, (local, county, state, and federal) resources may be limited due to significant impacts on local first response and emergency management agencies. Prioritization of efforts will be given to immediate life safety and health needs.

An emergency event may occur at any time of day or night and in any kind of weather, traffic congestion should be expected and can be chaotic.

The City has the primary responsibility for traffic management and emergency evacuation of residents and visitors within the City Limits of Glenwood Springs.

Garfield County has primary responsibility for emergency evacuation of residents and visitors in unincorporated areas.

Area schools, RE-1 School District, Valley View Hospital, assisted living facilities, and area businesses serving large tourist populations have the primary responsibility to evacuate populations and, in some cases, provide accountability for their populations.

The City of Glenwood Springs could have large numbers of visitors and tourists present during an emergency, due to the large local tourism industry. The size of the visitor population is dependent upon the season, the time of day, month, and year.

When a jurisdiction receives a request for assistance from another jurisdiction, reasonable actions will be taken to provide assistance.

If given a clear warning and direction, most people will follow evacuation orders; however, some individuals will not evacuate regardless of risk.

Most evacuees will find shelter with friends, relatives, or hotels and will not require a shelter.

Most people will self-evacuate in their own vehicles.

Personal preparedness is essential to effective evacuation. This is particularly true for individuals with disabilities and those with access and/or functional needs who may require additional time and assistance in evacuation.

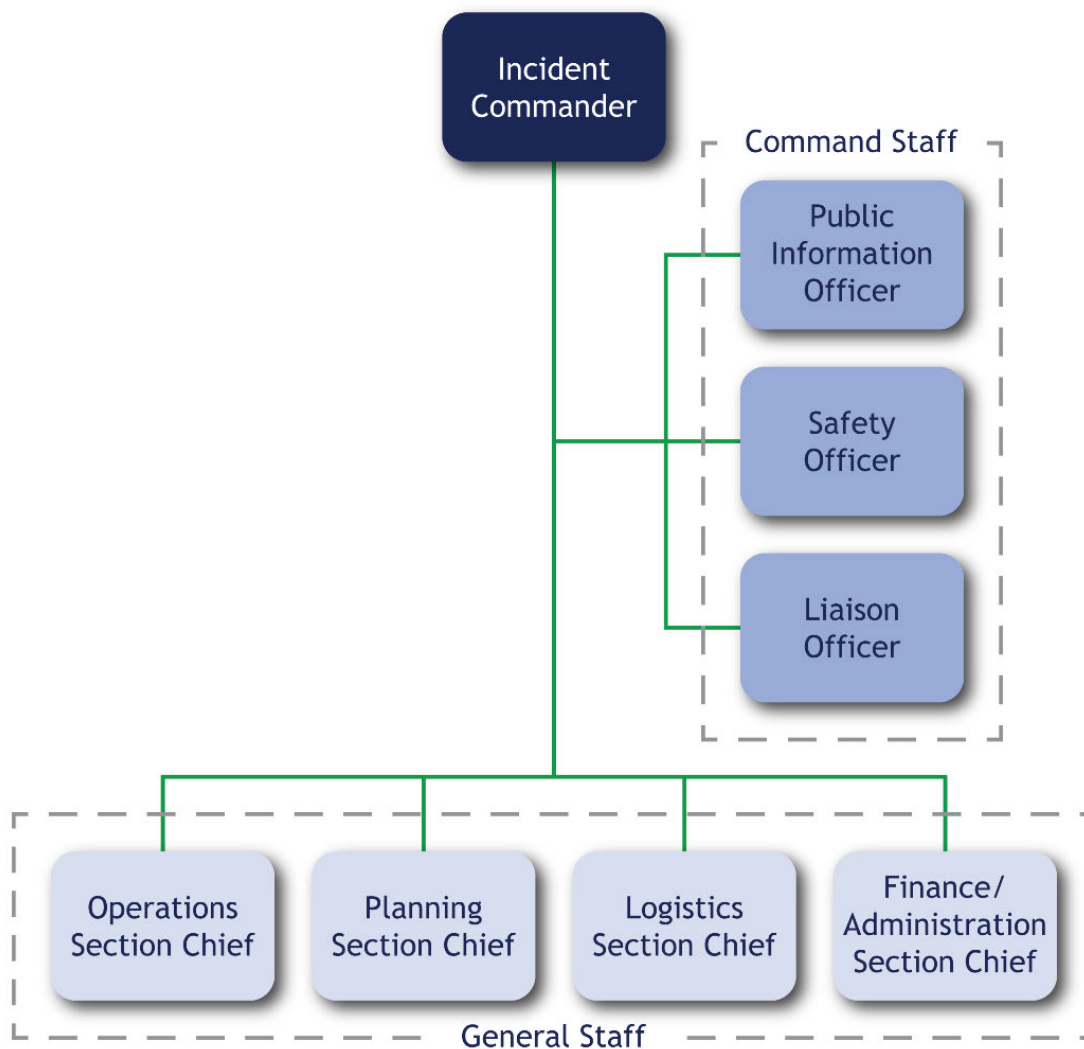
## 3 CONCEPT OF OPERATIONS

All emergency responses within the footprint of this plan will follow the National Incident Management System (NIMS) that has been specified by the Federal Emergency Management Agency.

[National Incident Management System \(fema.gov\)](https://www.fema.gov)

### 3.1 Incident Command System

The Incident Command System (ICS) is a command-and-control protocol for use by responding agencies at the incident scene. The ICS is just one part of the broader incident management process outlined in NIMS and will be used for all incidents. When an incident occurs within a single jurisdiction and without jurisdictional or functional agency overlap, the appropriate authority designates a single Incident Commander who has overall incident management responsibility. In cases where incident management crosses jurisdictional and/or functional agency boundaries, the various jurisdictions and organizations may still agree to designate a single Incident Commander. **Figure 4** depicts an example organizational structure for an ICS organization with a single Incident Commander.

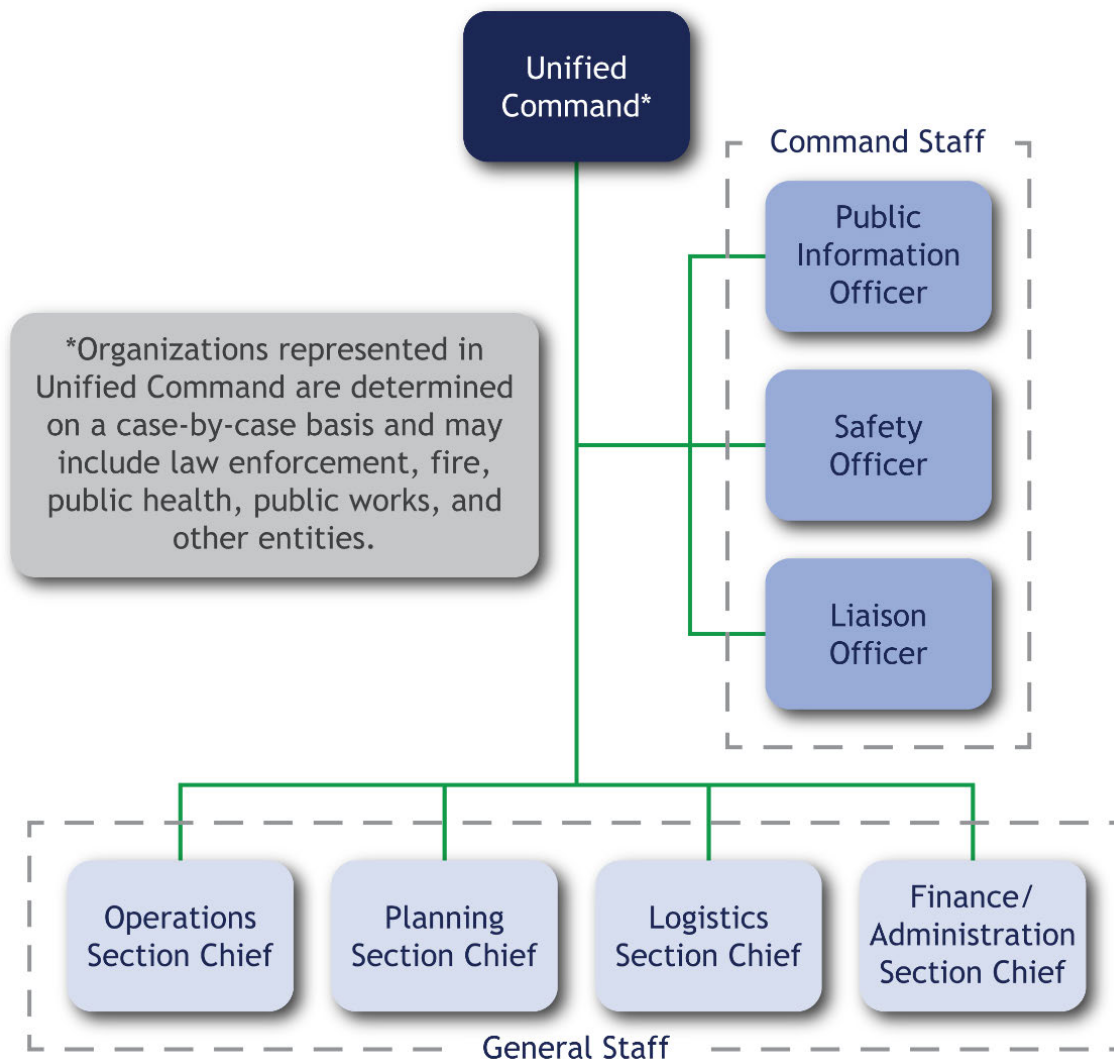


**Figure 4. Example of an ICS Organization with a Single Incident Commander**

### 3.2 Unified Command

Unified Command improves unity of effort in multijurisdictional or multidisciplinary incident management. The use of Unified Command enables jurisdictions and those with authority or functional responsibility for the incident to jointly manage and direct incident activities

through the establishment of a common set of incident objectives and strategies. Each participating partner maintains authority, responsibility, and accountability for its personnel and other resources, and each member of Unified Command is responsible for keeping other members of Unified Command informed. **Figure 5** depicts an example organizational structure for an ICS organization with Unified Command (UC).



**Figure 5. Example of an ICS Organization with Unified Command**

A basic premise of the Glenwood Springs Emergency Operations/Traffic Management Plan is that incidents are generally handled at the lowest jurisdictional level possible. Police, fire, emergency medical services, and other first responders are responsible for incident management and coordination at the local level. In the vast majority of incidents, local resources, county, and state mutual aid resources provide the first line of emergency response and incident management support. If the incident appears to go beyond the capabilities of the local jurisdiction, the Garfield County Emergency Manager will be notified to provide supplemental assistance. If necessary, an Emergency Operations Center (EOC) can be activated. All agency and department Memorandum of Understanding (MOUs) or Intergovernmental Agreements (IGAs) will be applied according to those agreements.

Planning for recovery will be implemented at the same time local government, agencies, and organizations are taking emergency response action necessary to protect the public. Preparations will be taking place for the deployment of resources to facilitate recovery.

## 4 ROLES AND RESPONSIBILITIES

### City of Glenwood Springs Staff and Administration:

- Development, coordination, dissemination, and training of the plan
- Disaster declaration
- Evacuation orders and re-entry decisions
- Assist in evacuation/traffic management within capabilities and as requested
- Assistance from other jurisdictions
- Activate an EOC, as necessary, to provide resource support and to maintain liaison with State and Federal authorities and authorities of other external support.
- Damage assessment
- Engineering services as needed

### Communication Authority:

- Lead agency for dissemination of emergency messages/warnings when directed by the Incident/Unified Command
- Emergency response notifications
- Notifications to other communication centers and TMCs

### Fire Agencies & EMS:

- Fire and emergency medical response
- Emergency medical transport
- Recommending and assisting in evacuation if the situation warrants
- Assist in the dissemination of emergency warnings within capabilities as directed by Incident/Unified Command
- Assist in evacuation and traffic management within capabilities and as requested
- Decontamination
- Damage Assessment
- Assist with the special needs population

### Law Enforcement:

- Emergency response to all hazard events
- Emergency evacuation route assistance
- Assist in dissemination of the emergency warnings as directed by Incident/Unified Command
- Coordinate transportation to shelters for those who need transportation assistance using buses, Emergency Medical Services (EMS), or other appropriate vehicles
- Emergency traffic control and crowd control
- Assist in evacuation within capabilities and as requested
- Security of evacuated areas and evacuation centers
- Search and Rescue operations



**Transportation Agencies and Public Works:**

- Clearing debris from roads as necessary to maintain evacuation routes
- Emergency traffic control and advanced warning notification
- Assist in evacuation within capabilities and as requested
- Traffic control along established routes
- Debris removal
- Traffic control equipment along established routes

**Transit Agencies:**

- Provide buses for temporary shelter from the elements as necessary.
- Emergency transportation for those in need (coordinated by law enforcement)

**Public Health and Valley View Hospital**

- Emergency medical care and coordination
- Medical support at all shelter locations
- Health advisories
- Identification of secondary health facilities and transportation

**The City of Glenwood Springs and Garfield County PIO Group:**

- Assist in the dissemination of the warning
- Assist with all emergency messaging as directed by Incident/Unified Command
- Assist with providing information at evacuation centers
- Monitor social media

**Local Schools:**

- Evacuation or shelter-in-place procedures
- Provide transportation services as needed if available
- Provide facilities for evacuees or emergency responders

**Volunteer agencies, i.e., The Salvation Army/Red Cross**

- Support shelters with welfare services (staff, food, drink, clothing)
- Maintain MOUs with necessary agencies
- Provides staffing and food to evacuees at evacuation centers and shelters

**Evacuation Center Manager:**

- Receive assignment from Incident Command
- Provide check-in and out to account for those evacuated
- Provide situation information to evacuees

## 5 ALL HAZARD RESPONSE, ASSESSMENT, AND CONTROL

### 5.1 ID Potential Significant Hazard and Public Safety Emergencies

Hazards that affect the City of Glenwood Springs and the surrounding area vary by type, size, time of day, and day of week. They can be natural (Acts of Nature), Technological (accidents or failure of systems or structures), or Human-caused (intentional or unintentional). The hazard may or may not affect or impact the entire community or affect portions of the community. Based on a combination of experience, forecasting, planning, and the type of emergency/event, Incident Command or Unified Command will make an assessment and determine how it may or may not affect the community.

### 5.2 Notification, Response, and Arrival to those Emergencies

Each responding agency is notified of an incident by one of three different communications centers or Traffic Management Centers (TMC). Those communication centers are the Garfield County Emergency Communication Authority (GCECA), the Montrose Regional Communication Center (MRCC), and the Hanging Lake Tunnel TMC (CDOT), see Table 4. Based on the initial information, agencies determine a response plan, and upon arrival at the scene an Incident Command (IC) is established.

**Table 4. Communication and Traffic Management Centers**

| Communication / Traffic Management Center         | Contact numbers             | Primary Service Agencies                                                                                                                     |
|---------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Garfield County Emergency Communication Authority | Non-Emergent:<br>[REDACTED] | Glenwood Spring Fire Department<br>Glenwood Springs Police Department<br>Garfield County Sheriff's Office<br>Garfield County Road and Bridge |
| Montrose Regional Communication Center - CSP      | Non-Emergent:<br>[REDACTED] | Colorado State Patrol<br>Colorado State Patrol Hazardous Materials Unit                                                                      |
| Hanging Lake Tunnel TMC - CDOT                    | Non-Emergent:<br>[REDACTED] | CDOT - Maintenance<br>CDOT - Hanging Lake Tunnel Operations                                                                                  |

### 5.3 Direction, Control, Coordination

Based on the incident assessment, the IC/UC will determine and implement life and property-saving measures. This assessment will include a scene size up which includes the type of scene, scene boundaries, scene and site security, communication protocol, traffic impacts and mitigation, closure points or areas, evacuation routes, alternate routes, public messaging, and additional resource requirements/requests.

For each incident, the IC/UC should have a general understanding of the community impacts, set priorities and incident objectives, and coordinate command and activities. Some of these priorities may include estimating a timeframe for clearing a scene, clearing the road, fixing infrastructure, restoring power, restoring traffic flow, or placing the situation back to normal levels of operation. The timeframe can be measured in minutes, hours, days, weeks, or months.

## 5.4 Determine Immediate Actions

Each immediate action fills a specific operational need based on critical time factors and the availability of safe travel routes to destination points. Depending on the size, type, and complexity of the emergency, all immediate actions could be implemented on the same incident. Types of immediate actions include:

- Interoperable communication and coordination
- Traffic management
  - Road closures
  - Staging areas
  - Vehicular storage and staging areas
  - Traffic control points and key traffic management locations
  - Alternate routes
  - Additional resources are needed and requested
  - Critical traffic management locations
  - Traffic queue monitoring and mitigation
- Public messaging - community alert notifications
- Shelter-in-place
- Pre-Evacuation warning
- Evacuation order

Based on the assessment, the IC/UC will begin mitigation efforts to help control the incident and the surrounding impacted area.

## 6 INTEROPERABLE COMMUNICATION AND COORDINATION

Effective communication is critical to the success of incident response efforts. To facilitate clear communication among responding agencies and their respective communication centers, use plain language. Interoperability of communication technology and equipment is essential to responders during emergencies and natural disasters. Agencies/departments in this area operate primarily on either the Digital Trunk Radio (DTR) or Very High Frequency (VHF) system. Cell phone communication is supplemental to radio communications in the case of operational issues, radio tower overload, or poor coverage areas. When interoperable radio communications are needed, the IC/UC will identify a designated command channel for the incident, and their communication center will verify if that particular channel is available and acknowledge the channel as Command. A communication center may also assign a command channel if requested by the IC/UC. If additional interoperable radio channels are needed for other functions, the IC/UC will assign those radio channels. If the incident involves traffic outside the City Limits of Glenwood Springs, refer to the Interoperable Communication Plan, **Table 5**. If the event is within the City Limits of Glenwood Springs involving solely city resources refer to the Glenwood Springs Operable Communication Plan, **Table 6**.

## INTEROPERABLE COMMUNICATIONS PLAN

[illegible]

## OPERABLE COMMUNICATIONS PLAN

| OPERABLE COMMUNICATIONS PLAN |                          |            |                                        |                                        |
|------------------------------|--------------------------|------------|----------------------------------------|----------------------------------------|
| Radio Channel Utilization    |                          |            |                                        |                                        |
| Channel                      | Function                 | Type       | Assignment                             | Remarks                                |
| [REDACTED]                   | [REDACTED]               | [REDACTED] | [REDACTED]                             | [REDACTED]<br>[REDACTED]               |
| [REDACTED]                   | [REDACTED]<br>[REDACTED] | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]<br>[REDACTED]<br>[REDACTED] |
| [REDACTED]<br>[REDACTED]     | [REDACTED]<br>[REDACTED] | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]<br>[REDACTED]<br>[REDACTED] |
| [REDACTED]                   | [REDACTED]               | [REDACTED] | [REDACTED]<br>[REDACTED]<br>[REDACTED] | [REDACTED]<br>[REDACTED]               |
| [REDACTED]                   | [REDACTED]<br>[REDACTED] | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]                             |
| [REDACTED]                   | [REDACTED]<br>[REDACTED] | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]                             |
| [REDACTED]                   | [REDACTED]<br>[REDACTED] | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]<br>[REDACTED]<br>[REDACTED] |
| [REDACTED]                   | [REDACTED]<br>[REDACTED] | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]<br>[REDACTED]<br>[REDACTED] |
| [REDACTED]                   | [REDACTED]               | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]<br>[REDACTED]               |
| [REDACTED]                   | [REDACTED]               | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]                             |
| [REDACTED]                   | [REDACTED]               | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]<br>[REDACTED]               |
| [REDACTED]                   | [REDACTED]               | [REDACTED] | [REDACTED]<br>[REDACTED]               | [REDACTED]<br>[REDACTED]               |
| [REDACTED]                   | [REDACTED]<br>[REDACTED] | [REDACTED] | [REDACTED]<br>[REDACTED]<br>[REDACTED] | [REDACTED]                             |

## 6.1 Cache Radio Request and Deployment

Garfield County Emergency Management has cache radios that can be deployed and assigned to other responders as needed. The cache radios are pre-programmed with the appropriate channels, have encryption capability, and are located in Rifle. The process for cache radio deployment is as follows:

- The IC will request cache radio(s) through the Garfield County Emergency Communications Authority (GCECA)
- The GCECA will contact Garfield County Emergency Management / Operations in this order:
  1. Emergency Manager - Commander C. Bornholdt
  2. Emergency Operations - Sergeant L. Burris
  3. Emergency Operations - Sergeant C. Whiting

If the communication center is busy, the IC may contact Garfield County Emergency Operations directly. Each radio requested will be transported by Emergency Operations resources and deployed promptly.

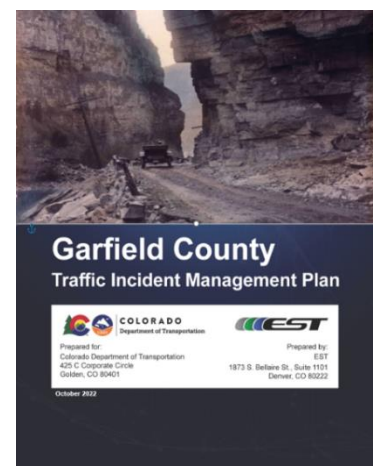
## 7 TRAFFIC MANAGEMENT

The management of traffic is critical for the movement and mobility of all roadway users. Traffic gridlock due to an emergency may significantly affect emergency response capability for all responders. Special consideration of traffic management needs to be given during the morning and evening rush hours, Monday - Friday. Also, to be considered, population increases due to tourism for seasonal events and activities. Any traffic hazard or obstruction will be removed as soon as possible, and traffic crashes should be relocated off the main travel routes to prevent traffic queues of excessive lengths. If the hazard or crash cannot be removed timely, the IC should utilize alternate routes with dedicated traffic control at critical intersections to expedite traffic flow.

### 7.1 Road Closures

Road closures for I-70 through Glenwood Canyon, South Canyon, and SH 82 will be handled per the Garfield County Traffic Incident Management Plan. Strategies to mitigate traffic congestion in Glenwood Springs consist of stage closures on I-70 at Dotsero, Canyon Creek, and West Rifle as well as on SH 82 at Garfield County Road (GCR) 154 - MP 5, SH 82 at GCR 114, and SH 82 at SH 133.

The IC will coordinate these closure points with necessary personnel from the state, county, and city, and later release of traffic at these locations in stages.



#### 7.1.1 Traffic Control Points and Key Traffic Management Locations

Due to the nature of the traffic patterns and primary commuting routes in and around Glenwood Springs, **Table 7** illustrates the key traffic control points and the resources needed to facilitate the movement of traffic. An interactive map link is included in **Table 7** for more detail. During an I-70 road closure that is anticipated to last longer than 2 hours, the IC should notify the Roaring Fork Transportation Authority (RFTA). RFTA will then make

necessary adjustments to travel routes and times. RFTA buses can also request buses traveling to Glenwood Springs from SH 82 be allowed to proceed past the SH 82 closure point.

**Table 7. [Key Traffic Control Locations](#)**

| Intersection | Primary Jurisdiction  | # of responders | T/C Devices | Notes |
|--------------|-----------------------|-----------------|-------------|-------|
|              | CDOT, CSP, GCSO       |                 |             |       |
|              | CDOT, CSP, GCSO       |                 |             |       |
|              | CDOT, CSP, GSPD       |                 |             |       |
|              | CDOT, CSP, GSPD, GSPW |                 |             |       |
|              | CDOT, CSP, GSPD, GSPW |                 |             |       |
|              | GSPD, GSPW            |                 |             |       |
|              | GSPD, GSPW            |                 |             |       |
|              | CDOT, CSP, GSPD       |                 |             |       |
|              | CDOT, CSP, GSPD       |                 |             |       |
|              | CDOT, CSP, GSPD, GSPW |                 |             |       |
|              | GSPD, GSPW            |                 |             |       |
|              | GSPD, GSPW            |                 |             |       |
|              | GSPD, GSPW            |                 |             |       |
|              | GSPD, GSPW            |                 |             |       |
|              | GSPD, GSPW            |                 |             |       |
|              | CDOT, CSP, GSPD, GSPW |                 |             |       |
|              | GSPD, GCR&B           |                 |             |       |
|              | CDOT, CSP, GCSO       |                 |             |       |



### 7.1.2 Traffic Queue Monitoring and Mitigation

Traffic queues develop quickly following a traffic incident. They need to be monitored and mitigated to reduce secondary crashes and incidences that require additional emergency response. Appropriate advanced warning devices upstream of the incident need to be deployed as soon as possible to provide traveler information. Continued monitoring of traffic queues is necessary and relevant information must be communicated to the IC promptly.

Grand Avenue (SH 82) and Midland Avenue are primary traffic routes through Glenwood Springs and once these routes become congested, mitigation efforts should be determined by the IC. Mitigation efforts will consist of alternate routes, staged closures upstream, public messaging, and additional traffic control units to manage critical intersections.

### 7.1.3 Glenwood Springs Traffic Management Resources

Glenwood Springs Public Works has a variety of traffic management/control devices and equipment. Traffic Control devices include barricades, portable VMSs, cones, and barrels. Additional equipment that can be used to mitigate traffic are skid steers, front-end loaders, personnel equipment, etc. Each of these devices and tools are stored at the fleet shop (2222 Devereux Road) or the TCD/E south yard (810 GCR 116). If additional support is needed, Public Works maintains a vendor list (A1 Traffic Control, Alexander United, Traffic Control Specialists) that can be called in to assist.

Mobilization of any requested support may be affected by traffic volumes and road closures. The IC/UC will make a request, through their communication center, to Public Works to provide traffic control personnel and equipment at the desired intersection/streets/roadways to help manage traffic. A Public Works lead will communicate to the IC/UC based on the communication plan and utilize their assigned VHF radios for internal communications. The Public Works lead will provide an estimated time of arrival (ETA) and expedite resources to the desired location. When Public Works resources arrive at the requested location, or if they are delayed due to unforeseen conditions, they will notify the IC/UC. Once at the requested location, they will remain there until relieved by the IC/UC.

Each agency should make reasonable attempts to assure all traffic control personnel wear high-visibility safety apparel (ANSI vest) that meets the requirements of the Manual on Uniform Traffic Control Devices (MUTCD). [2009 MUTCD with Revisions 1, 2, and 3 incorporated, dated June 2022 \(PDF\) - FHWA MUTCD \(dot.gov\)](#) The MUTCD also describes the exemptions for law enforcement, firefighters, and other emergency responders.

### 7.1.4 Additional Resource Requests

All additional resource requests will be determined by the IC/UC. Additional resources include but are not limited to personnel, traffic control devices/barricades, radios, vehicles, specialized personnel, and communication tools. Resource requests will be passed on to the communication center from the requesting agency. All acquired resources will be appropriately checked in per the pre-identified agreements and/or through the IC/UC.

## 7.2 Alternate Routes

The control of the roadway(s) is the responsibility of the law enforcement agency and the transportation department having jurisdictional authority. Traffic control operations and all

decisions on road closures, alternate routes, or other traffic control functions should be communicated from the IC/UC.

When the primary alternate route is restricted or undesirable, a different alternate route may be initiated by the IC/UC. Before an alternate route plan is initiated, the IC/UC should verify that neither construction activities nor maintenance issues are present along the route. Garfield County Road & Bridge, Glenwood Springs Public Works, and CDOT should be contacted to confirm the suitability of all alternate routes. The primary alternate routes in this area are:

- I-70
- US 6
- SH 82
- Midland Avenue
- GCR 154

### 7.3 CDOT VMS and Camera Locations

For CDOT-controlled Variable Message Signs (VMS), CDOT will determine and implement the correct messages to be displayed during incidents. CDOT, the City of Glenwood Spring Public Works, and Garfield County Road and Bridge may use portable VMSs to warn drivers of the situation and provide information to motorists such as road closed, local traffic only, and alternate routes. CDOT controlled cameras are also a useful tool to monitor traffic. These are public cameras and can be monitored by the IC/UC, other communication centers, and an EOC. Useful VMS and camera locations are in **Table 8**.

**Table 8. VMS and Camera Locations**

| VARIABLE MESSAGE SIGN | MILEPOST | CDOT CAMERAS     | MILEPOST |
|-----------------------|----------|------------------|----------|
| <b>Interstate 70</b>  |          |                  |          |
|                       |          | Camera Eastbound | 86       |
| VMS Westbound         | 51       | Camera Eastbound | 96       |
| VMS Eastbound         | 86       | Camera Westbound | 108      |
| VMS Westbound         | 92       | Camera Eastbound | 115.95   |
| VMS Eastbound         | 105      | Camera Eastbound | 116.20   |
| VMS Westbound         | 109      | Camera Eastbound | 116.60   |
| VMS Eastbound         | 115      | Camera Eastbound | 116.85   |
| VMS Westbound         | 140      | Camera Westbound | 117      |
| VMS Westbound         | 157      | Camera Eastbound | 118.25   |
|                       |          | Camera Eastbound | 118.00   |
|                       |          | Camera Eastbound | 118.70   |
|                       |          | Camera Westbound | 120      |
|                       |          | Camera Westbound | 122      |
|                       |          | Camera Eastbound | 123      |
| <b>SH 82</b>          |          |                  |          |
| VMS Westbound         | 12       | Camera Westbound | 12       |
| VMS Eastbound         | 11       | Camera Eastbound | 21       |
| VMS Westbound         | 37       | Camera Eastbound | 23       |
|                       |          | Camera Eastbound | 26       |
|                       |          | Camera Westbound | 29       |
|                       |          | Camera Eastbound | 35       |

## 7.4 Event Termination

Once all response and mitigation activities have ended and the situation has returned to normal operating conditions with no threat to life and property, the incident will be terminated by the IC/UC. For a traffic incident or an incident that restricts the movement of traffic, the event is not complete until the hazard is removed or has ended, and the roadway(s) is clear of the hazards and emergency responders.

Once the incident is clear and the IC is ready to initiate normal traffic flow, the IC needs to prepare a plan and communicate that plan to all those participating including all traffic control point personnel. The IC will inform the GCECA and then properly execute the plan. If a command channel has been assigned to the incident, the IC will properly terminate the channel so all responding assets are aware and can return to their normal assigned operational channel. Any available units should continue to monitor the area as needed.

## 8 STAGING AREAS

The IC/UC should consider the use of staging areas for responding agencies or personnel who are assisting. The establishment of a staging area is situation-dependent and will vary from incident to incident. For incidences on I-70, on and off-ramps can be used. Drop zones can also be utilized for damaged vehicles involved in crashes. Drop zone locations consist of the I-70 on and off ramps, parking lots, and roadways adjacent to the affected area.

Guidelines to be considered when setting up staging areas:

- The IC/UC will establish a staging area near the incident or an adjacent roadway, on the roadway shoulder, or parking lot.
- The IC/UC will notify the communication center of its exact location and how to access the area.
- If necessary, a Staging Area Manager will be identified.
- Resources will remain at the staging area until assigned.

## 9 VEHICLE STORAGE LOCATIONS

### 9.1 Passenger Vehicle Storage Locations

During events that require road closures, vehicle storage areas become necessary to reduce overall traffic congestion, prohibit vehicles from parking in the travel lanes, and provide a safe location for all motorists. Access to food, water, and restrooms should also be considered if possible. The need to implement a vehicle storage parking plan will depend on the incident or closure type, expected duration, weather conditions, and road conditions. To help facilitate traffic in and out of the passenger vehicle storage areas, local law enforcement should consider assigning personnel to monitor the parking area and provide information to those using the storage areas. All passenger vehicle locations being utilized should be coordinated and communicated to the IC/UC as well as frequent updates on the status of each storage location. See **APPENDIX D: VEHICLE STORAGE AREAS** for all vehicle storage areas.

## 9.2 Commercial Motor Vehicle Storage Locations

Commercial Motor Vehicle (CMV) storage areas should be limited to those pre-identified due to the amount of space needed and the maneuverability of CMVs. The Garfield County TIMP has designated CMV parking plans, and they include designated parking along US 6 and beyond the closure point along I-70, Exit 114, or Exit 116. CDOT must be contacted to review, coordinate, and execute the use of any of the CMV parking areas along a state or federal highway. In addition to the Garfield County TIMP CMV storage locations, an additional closure point on WB I-70 at MP 118, just before the No Name tunnel entrance, can be utilized. As soon as this location is full, CMVs will be directed to exit WB I-70 at Exit 119, proceed EB on I-70, and park in the Dotsero Emergency Parking lot. All CMV storage locations being utilized should be coordinated and communicated to the IC/UC as well as frequent updates on the status of each storage location. See **APPENDIX D: VEHICLE STORAGE AREAS** for vehicle storage areas.

Commercial motor vehicle parking area guidance:

- When a closure is implemented, CMVs will immediately be informed via VMS messages of the location of the closure point.
- When needed, appropriate traffic control resources will be notified to respond.
- When parking CMVs past the staged closure location, law enforcement will set the placement of the first truck, and then send the rest to line up behind them. This creates a safe zone for them without creating further congestion on local municipality roadways. They must proceed to the right shoulder of the road in an orderly manner and await directions. CMV drivers will be informed not to leave until they get authorization from a traffic control official to proceed.

## 10 PUBLIC INFORMATION AND MESSAGING

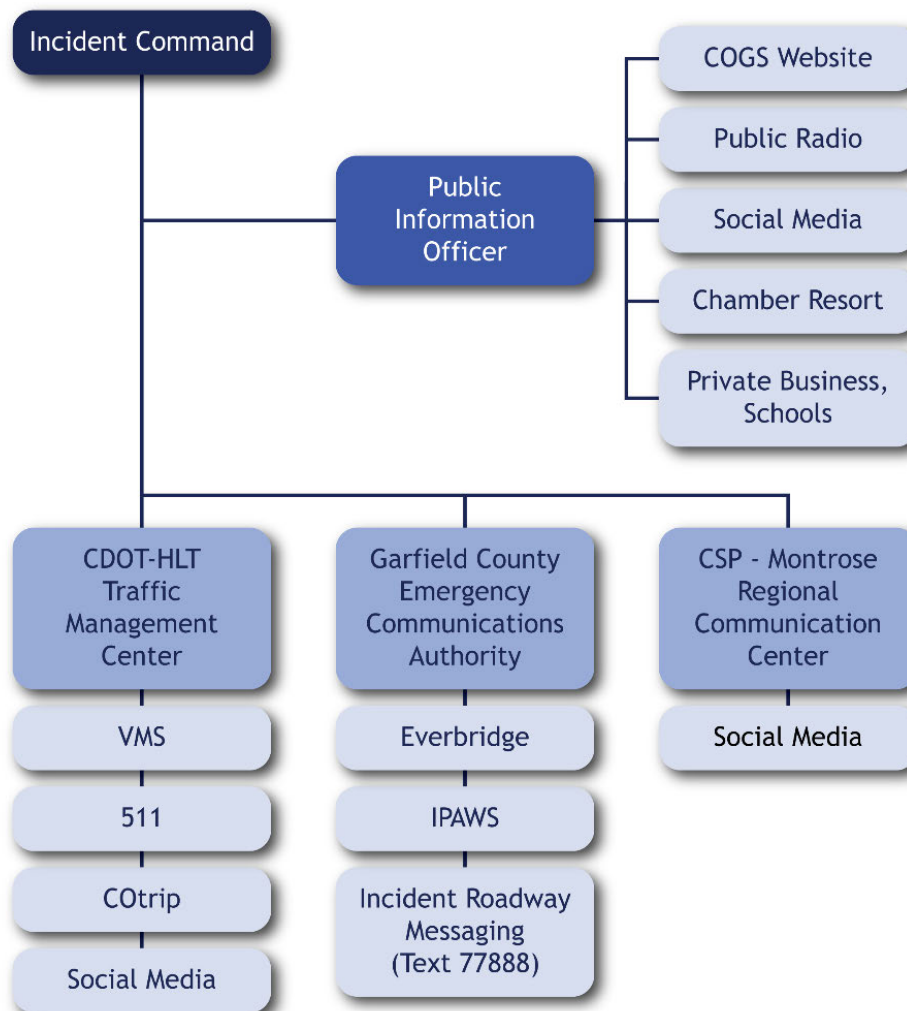
Coordination with public and media information will be managed by the IC/UC. The Public Information Officer (PIO) from the responsible agency, if one is designated for the incident, should release information only with prior approval from the IC/UC or the Joint Information Center (JIC). This lead PIO will be the only direct media contact and will coordinate with responding agencies' media personnel to provide timely and consistent information to the public. The lead PIO may appoint a PIO from another agency to answer media questions in coordination with the lead agency's responsibility (crash/police activity - Law Enforcement, Fire - Fire Department, Road & Weather - CDOT).

### 10.1 Community Alert Notifications

Public notification distribution platforms include text, call, subscriber-based alerts, television, radio, social media, website, print, and variable messaging signs. A combination of some or all methods may be used depending on the nature of the event. **Figure 6** is a hierarchy chart for public messaging. Messaging can consist of descriptive content about the hazardous situation, evacuation notices, road closures, law enforcement activity, travel routes, traffic conditions, or prescriptive recommendations that indicate where to go and which route to take. They should also include appropriate translated messages (i.e., Spanish) to engage the entire community.

## Public Notification Methods

- Everbridge
- Integrated Public Alert & Warning System (IPAWS)
- Incident/roadway user messaging - GCECA (Text 77888)
- Government website
- Public radio
- Social media (Facebook, Instagram, Snapchat)
- Internal private business, schools, and tourist locations messaging systems
- CDOT messaging platforms - 511 system, VMS, real-time alerts through text/email messages, COTrip.org, and Facebook.



**Figure 6. Public Notification Flowchart**

Critical information will be disseminated by the various alert and warning systems at the request of the IC/UC through the GCECA. The GCECA will use Everbridge and IPAWS to send out information related to the incident. The IC/UC may request the GCECA issue an Everbridge or IPAWS notification, but the message must be approved by the GCECA authority prior to being disseminated. Pre-built templates should be considered for efficiency. See the information below for Everbridge and IPAWS Messaging.

Everbridge is used to communicate local emergency messages to relay critical information and instructions such as evacuation notices, shelter-in-place, law enforcement activity, etc.

Things to consider before requesting an Everbridge message:

- Time of day
- Population in the desired area
- Level of urgency
- Is a text sufficient?

Keep in mind that heavily populated areas may overload the system causing failures, so messages should be brief (120 characters).

For active events, the GCECA can create an “Event Code” for information dissemination. These codes are for use during major events where non-Garfield County residents need a way to get information or when residents may need updates on an ongoing major event such as a wildfire. As an example, GARCOROADS has already been created for roadway events (i.e., road closures) and the GCECA can run up to four active “Event Codes” simultaneously.

ReachWell is an Application (APP) that can be downloaded that will translate messages in over 100+ languages. After the APP is downloaded to your mobile device, add “GARCO911: Garfield County 911” as a user group to get messages translated into a selected language.

IPAWS will reach a significantly greater population due to the difference in method of delivery. The two primary methods of delivery are Wireless Emergency Alerts and the Emergency Alert System (Audio & Text)

Things to consider before requesting an IPAWS message:

- Does the hazardous situation require the community to take action?
- Does the hazardous situation pose a threat to life or property?
- Is there a high degree of probability a hazardous situation will occur?
- Do other means of information dissemination ensure rapid delivery of urgent information?

## 11 EVACUATION

The identification of a threat or hazard that could lead to an evacuation or a shelter-in-place order is the first phase in any evacuation procedure. Once a threat is identified, an evacuation order moves the most vulnerable, threatened population away from a potential area of impact. A shelter-in-place order shelters identified populations where they are, when and where conditions support the order.

### 11.1 Evacuation Decisions

Ordering a shelter-in-place, pre-evacuation warning, or evacuation order is the responsibility of the local authority having jurisdiction. Evacuation decisions should not be delayed if the time it would take to obtain the proper approvals would endanger lives. The IC/UC should monitor all incidents that may result in evacuations and activate the Emergency Operations Center (EOC) if it is anticipated additional support may be needed. The IC/UC will be the one(s) with the necessary situational awareness to recommend either an evacuation or shelter



order as the preferred method of protecting lives before, during, or after disasters or emergencies. This will vary depending on the hazard or the threat to public safety.

Primary life safety evacuation information will be disseminated by the various alert and warning systems at the request of the IC/UC through the GCECA. It is the responsibility of the IC/UC to notify the GCECA of any evacuation orders and provide geographic boundaries (Evacuation Zones), evacuation instructions, and any evacuation routes.

For slow-developing or pre-planned situations, evacuations may be planned and coordinated ahead of time.

Personnel (or their designee) who can order an evacuation in the City of Glenwood Springs and Garfield County are independent of one another and include the following:

- City of Glenwood Springs City Manager
- Garfield County Sheriff
- Glenwood Springs Fire Chief
- Glenwood Springs Chief of Police
- Garfield County Emergency Manager
- Governor of the State of Colorado

If the threat or incident exceeds the local response capabilities, the Garfield Emergency Manager be notified to assist with coordination of the efforts and provide supplemental assistance.

## 11.2 Pre-Evacuation Warning

A pre-evacuation warning is an alert to community members in a defined area of a potential threat to life and property in an emergency incident. Pre-evacuation warnings may require transportation and traffic control resources in addition to those utilized during normal conditions.

## 11.3 Shelter-in-Place

Depending on the incident type and location, an evacuation may not be required or recommended. A shelter-in-place order is appropriate when conditions require that individuals seek protection in their homes, places of employment, or other locations when a hazard or threat is imminent or occurring. People may not have enough time to evacuate from the hazard or threat and can shelter-in-place as a safer alternative. Additionally, this can minimize traffic impacts and help keep roads clear for those in the most immediate danger. Individuals without access and functional needs should be a priority for restoration of services and safety checks as they may be at greater risk throughout a prolonged shelter-in-place order. Pre-incident and post-incident shelter-in-place orders may occur simultaneously with life-saving response operations.

Factors to consider include:

- When sheltering in place, people generally feel safer, are better prepared, and recover faster from incidents.
- The consequences of putting people on the road during an event often far outweigh the risks of ordering them to shelter in place.
- Shelter-in-place orders should be communicated through the normal channels as in any disaster event. Incident PIOs may request assistance from the EOC to facilitate this.



- The IC/UC may assist with the dissemination of information to the public in accordance with the public information section.
- When sheltering in place is not enough to ensure the safety of residents and the public, evacuation orders may be issued. It is the responsibility of the IC/UC or EOC to determine the best course of action depending on the scope of the incident, type, time, and location.

## 11.4 Evacuation

The goal of an evacuation is to move as few people as needed the shortest distance to safety. An evacuation may require transportation and traffic control resources in addition to those utilized during normal conditions.

The decision to evacuate will be based on maximizing the preservation of life first, then protecting property, the environment, and the economy. Several factors will need to be considered including:

- The capacity to safely move all population groups.
- The transportation system and roadway conditions.
- The expected event duration.
- The weather forecast.
- The rate of spread (wildfire), level of flooding, and plume size (hazardous material).
- Review of the current and anticipated hazard behavior, such as a fire or flood.

Evacuations are recommended when one or more of the following conditions are met:

- Citizen safety is under continuing threat.
- First-response agencies cannot adequately address the needs of the residents while also responding to the incident.
- Public health concerns are significant and not sufficiently mitigated by shelter-in-place measures.
- Infrastructure cannot support residents, i.e., no food, clean water, or power for an extended period of time.
- The risks of sheltering in place outweigh the risks of evacuating.

## 11.5 Public Messaging and Information

Coordination with public and media information will be managed by the IC/UC as described in 10. Public messaging and information should be accomplished through the use of clear, consistent, and accessible methods. This will effectively relay information regarding any threat or hazard, as well as the actions being taken, and the assistance being made available for all communities.

## 11.6 Evacuation Zones

Evacuation zones promote phased, zone-based evacuation, which allows authorities to prioritize evacuation orders to the most vulnerable zones first and limit the need to evacuate large areas not under threat.

Pre-established evacuation zones help:

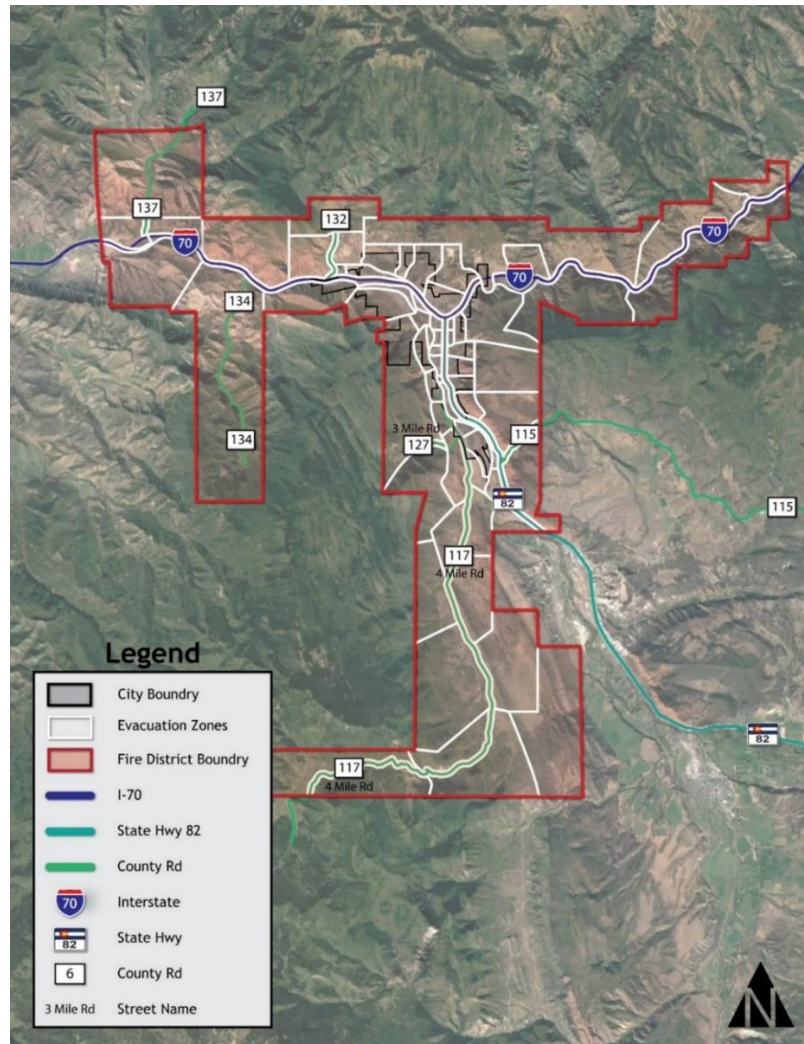
- Jurisdictions to understand transportation network capacity, critical transportation and resource needs, and shelter demand.

- Planners to develop planning factors and assumptions to determine goals and objectives.
- Community members to understand protective actions to take during an emergency.
- Shelters to limit traffic congestion and select locations suitable for the evacuated population.

Evacuation zones have been identified for the City of Glenwood Springs and the geographic boundaries of the GSFD. These zones were established with these considerations:

- Natural topography
- Major roadways and identified evacuation routes
- Existing neighborhoods
- US census data
- City of Glenwood Springs zone map

Each zone has been identified by a sequential number (GWS 7001). **Figure 7** shows the overall evacuation zone map with a link to provide more detail.



**Figure 7. Evacuation Zones**  
[Glenwood Springs Evacuation Zones](#)

## 11.7 Evacuation Routes

Within the City of Glenwood Springs and the geographic boundaries of the GSFD, several roads and highways have been identified as evacuation routes. All the evacuation routes are consistent with the alternate routes to manage traffic. Each evacuation route leads to I-70, US 6, or SH 82 and in many cases, serve as the only roadway from a specific area within the geographical boundaries of the GSFD. Although each evacuation route has been pre-determined, other routes may be developed as needed. **Table 9** and **Figure 8** show evacuation zones and evacuation routes.

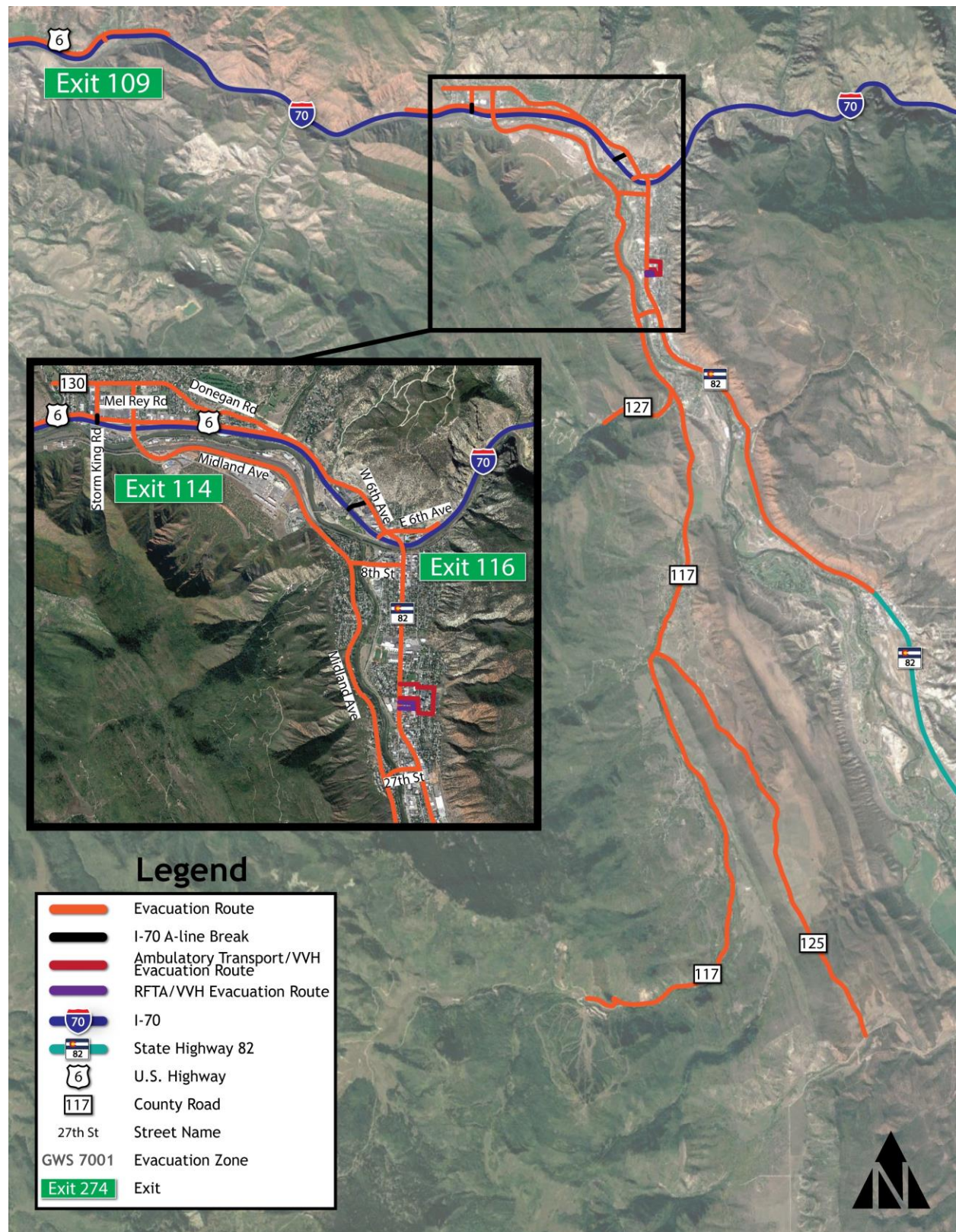
The pre-identified evacuation routes are:

- US 6
- Donegan Road (GCR 130)
- Storm Creek Road - I-70 Access Line Break
- Mel Ray Road
- Midland Avenue
- West 1<sup>st</sup> Street - I-70 Access Line Break
- East 6<sup>th</sup> Street
- Grand Avenue, South Glenn Ave., (SH 82)
- 8<sup>th</sup> Street
- 27<sup>th</sup> Street
- 3-Mile Road (GCR 127)
- 4-Mile Road (GCR 117)
- Dry Park Road (GCR 125)

**Table 9. Evacuation Zones and Evacuation Routes They Serve**

| Evacuation Zone(s) | Primary Evacuation Route                                                 | Alternate Evacuation Route                                                | Alternate Evacuation Route                          |
|--------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------|
| GWS 7001-7006      | WB US 6 to WB or EB I-70                                                 | WB US 6 towards New Castle                                                |                                                     |
| GWS 7007-7012      | Donegan Rd > Storm King Rd Access Point/Mel Ray Rd > US 6 > I-70         | Donegan Rd > US 6 > West 1st Access Point > I-70                          | Donegan Rd > US 6 > Grand Ave > SH 82               |
| GWS 7013-7016      | US 6 > West 1st Access Point > I-70                                      | US 6 > I-70 Exit 116                                                      | US 6 > Grand Ave. > SH 82                           |
| GWS 7017-7021      | Midland Ave. > I-70 Exit 114                                             | Midland Ave. > 8th St. > Grand Ave. > I-70 Exit 116                       | Midland Ave. > 8th St. > Grand Ave. > SH 82         |
| GWS 7022-7029      | Midland Ave. > 8th St. > Grand Ave. > I-70 Exit 116                      | Midland Ave. > 27th St. > S. Glen Ave. > SH 82/I-70                       | Midland Ave. > 8th St. > Grand Ave. > I-70 Exit 114 |
| GWS 7030-7044      | Grand Ave > 6 <sup>th</sup> St > I-70 Exit 116                           | Grand Ave. > 8th St. > Midland Ave. > I-70 Exit 114                       | Grand Ave. > SH 82                                  |
| GWS 7045-7048      | GCG 154 > SH 82                                                          |                                                                           |                                                     |
| GWS 7049-7061      | GCR 117 (4-Mile Rd) > Midland Ave. > 27th St > S. Glen Ave. > SH 82/I-70 | Midland Ave. > 8th St. > Grand Ave. > 6 <sup>th</sup> St. > I-70 Exit 116 | GCR 117 (4-Mile Rd) > GCR 125 (Dry Park Rd)         |





**Figure 8. Evacuation Routes**  
Glenwood Springs Evacuation Routes

Management of the evacuation routes rests primarily with the law enforcement and transportation agencies having jurisdictional authority. During a mass evacuation event, decisions on traffic flow and evacuation routes are determined by the IC/UC in conjunction with the law enforcement agency having jurisdiction. During an emergency, clearing the roads for emergency response and movement of resources becomes critical to operations. The City of Glenwood Springs Public Works, Garfield County Road & Bridge, and the Colorado Department of Transportation shall coordinate emergent road clearings and maintenance.

An overall guide which documents all the evacuation routes and zones, areas of refuge/safe zones, critical facilities, critical intersections, evacuation scenarios, and special considerations, has been developed. See **APPENDIX A: Evacuation Guide**.

### 11.8 I-70 Access Line Breaks

The Federal Highway Administration (FHWA) and CDOT have the authority to approve each access line break for emergency purposes only. Each access line break will be equipped with a locked gate controlled by a secured key/code. An agreement has been developed between CDOT and local jurisdictions concerning the operation and maintenance of the gates and related standard operating procedures.

Each break in the control of access to the Interstate System right-of-way is considered to be an access point. Each entrance to I-70, is considered to be an access point and controlled by a “locked gate”. **Table 10** indicates those agencies permitted to open each access gate and the gate lock key holders.

**Table 10. A-Line Break Gate Operations & Key Holders**

| Permitted to Open Access Line Break Gates | Permitted Key Holders                                                   |
|-------------------------------------------|-------------------------------------------------------------------------|
| Colorado Department of Transportation     | LTC Ops Hanging Lake Tunnel Operations<br>Resident and Program Engineer |
| Glenwood Springs Fire Department          | Glenwood Springs Fire Chief                                             |
| Glenwood Springs Police Department        | Police Chief and Lieutenants                                            |
| Glenwood Springs Public Works             | Glenwood Springs Public Works Director                                  |
| Garfield County Sheriff's Office          | Garfield County Emergency Manager                                       |
| Colorado State Patrol                     | Colorado State Patrol Captain                                           |

Two access line breaks along I-70 in Glenwood Springs are under design and are anticipated to be completed in 2023/2024; they are depicted in **Figure 9**. They provide a direct route onto I-70 from Storm King Road and West 1<sup>st</sup> Street to support saving lives and property. When necessary, the IC/UC will utilize the I-70 access line breaks from Storm King Road or West 1<sup>st</sup> Street for evacuation/emergency traffic management purposes.





**Figure 9. Access Line Break Locations along I-70**

#### 11.8.1 General guidelines for the use of I-70 Access Line Breaks

- The agreement between CDOT and local jurisdictions concerning the operation and maintenance of the gates designates the IC as one of the following:
  - Glenwood Springs Police Chief
  - Glenwood Springs Fire Chief
  - Garfield County Emergency Manager
  - Garfield County Sheriff
  - Other personnel as designated by the four listed above.
- The IC will determine when an evacuation will be initiated and coordinate with CDOT and the City of Glenwood Springs official(s).
- The IC will brief CDOT on the emergency situation and request traffic control assistance from CDOT and law enforcement.
- CDOT will make all necessary internal and public notifications and provide resources to close I-70 near the access line's access point with appropriate traffic control personnel and devices.
- Law enforcement will be present to provide traffic control support at each access line's access point.
- CDOT and law enforcement will take a position on I-70 at the access point as well as any appropriate ancillary roadways and authorized personnel will open the locked gate to allow traffic flow onto I-70.
- CDOT and law enforcement will appropriately direct traffic onto I-70 from Storm King Road/US 6 or West 1<sup>st</sup> Street.
- Traffic control channeling devices should be used, as needed, per CDOT's direction and plans.
- Once traffic congestion is mitigated and the emergency evacuation access point is no longer needed, the IC will notify CDOT and all necessary personnel.
- CDOT will acknowledge the request and take the necessary steps to securely close the access point, lock the gate, and return traffic flow to normal routes.

## 11.9 Counterflow Lane Reversal

Counterflow reverses the normal flow of traffic (typically one or more lanes in the opposing direction) to increase the flow of outbound vehicle traffic during an evacuation. Counterflow operations may cause issues at jurisdictional borders if the transition from counterflow lanes to normal lanes is uncoordinated, which can significantly slow the evacuation. Properly executed counterflow requires significant resources and time, and it is most applicable when an expedited large-scale evacuation is necessary. Generally, coordinating counterflow takes place at the Incident Command Post (ICP) or the EOC and requires considerable planning to avoid any interference with response operations.

During an emergency, clearing the roads for emergency response, evacuation, and movement of resources becomes critical to response and recovery operations. Counterflow operations may interfere with this important function. The City of Glenwood Springs Public Works, the Garfield County Road and Bridge Department, and the Colorado Department of Transportation shall coordinate emergent road debris clearing and maintenance within their jurisdiction.

## 11.10 Animal Evacuation and Sheltering Locations

Evacuation of pets and large animals is primarily the responsibility of the pet/animal owners. As soon as the need is identified, the IC/UC should request support from the Garfield County Fairgrounds to support evacuating housing animals. The GCECA should forward this request to the appropriate resource for approval and acceptance. If necessary, the City of Glenwood Springs and Garfield County Animal Control can assist in the evacuation of animals, small and large, from a hazardous zone.

Assumptions regarding animal evacuation and sheltering:

- Spontaneous volunteers may arise during evacuations, specifically to assist in the evacuation of large animals. The IC/UC should be hesitant to officially deploy these volunteers into active hazardous zones as private citizens.
- Owners are encouraged to have evacuation plans in place and utilize available resources when evacuating large animals. Any pet evacuation plans should also include any food and medication needed for the duration of the evacuation.
- Recovery of animals “let loose or lost” during an evacuation, either by private citizens or response agencies, is primarily the responsibility of the animal owners. Service animals will evacuate with their owners as part of the general population.

## 11.11 Evacuation Check-in / Check-out Procedures

Check-in and out operations will be conducted by the law enforcement agency having jurisdiction or their designee. Required check-in information will consist of the date checked in, evacuee’s name, address evacuated from, contact phone number(s), special needs, check-out date, and destination. Evacuees may be assigned to shelters based on the area of their residence. An evacuation check-in / check-out checklist is provided in **APPENDIX I: EVACUATION CHECK IN CHECK OUT PROCEDURES**.

## 11.12 Evacuee Tracking and Accountability

Accountability of evacuated persons focuses on the timely and accurate accounting of evacuees. Clear communication, activation of appropriate and sufficient support resources, and eventual safe re-entry of the affected public to an area impacted by a natural or manmade disaster is critical. Through the use of a pre-established evacuee check-in and out



system, the City of Glenwood Springs expects to ease the process of identity verification and accountability of evacuated residents.

Citizens who self-evacuate or evacuate by public transportation may be asked to indicate they have already vacated their residence by displaying a door tag or sign indicating the home is vacant. These self-evacuated signs should be visible, conspicuous, and in the front (street-side) of their home.

### 11.13 Areas of Refuge, Safe Zones (Large Groups of People)

Areas of refuge are primarily for displaced populations. These locations may temporarily and safely hold people for short-term relief during a wildfire or other emergency when evacuation routes have been compromised and may not be safe or possible. Affected populations should go to a preplanned safe zone, as directed by IC/UC, such as a large field, parking lot, athletic field, park, open greenspace or previously burned areas with no flammable overstory/canopy that is clear of all hazards.

Areas of refuge have been identified; however, they are not limited to these locations. A list or pre-determined areas are included in **APPENDIX E: AREAS OF REFUGE / SAFE ZONES**. They should be staffed and monitored by emergency personnel, provide timely and accurate information to the population, identify transportation needs, as well as provide needed supplies or resources.

### 11.14 Evacuation Area Security

Following an evacuation, law enforcement agencies will coordinate security for the evacuated area. A combination of resources from the Glenwood Springs Police Department (GSPD), Garfield County Sheriff's Office (GCSO), the Colorado State Patrol (CSP), and other law enforcement resources will provide security. Coordination of these efforts should be managed by the appropriate agency having jurisdiction or the IC/UC.

Other security considerations are:

- Officers, deputies, and troopers should be briefed on evacuation plans, notices, and their responsibilities.
- Any law enforcement officer or personnel responding from outside agencies are under the operational control of the IC or EOC while conducting operations for the incident.
- Access control points (ACP) will be established to ensure only properly identified and credentialed personnel have access to the evacuated area.
- Patrols of the evacuated areas, when appropriate, will be coordinated by the proper authority having jurisdiction.

The IC/UC or the EOC will coordinate movement of evacuees back into a community once the threat or hazard dissipates and the event causing the evacuation ends. Re-entry will begin once first responders have stabilized the area to a point where residents can return, and this will initiate the recovery phase of the hazard.

### 11.15 Re-entry and Recovery

Every effort will be made to allow evacuees to return to their homes and businesses. Re-entry and recovery planning should incorporate input from the IC/UC and/or the EOC. The status of the incident will weigh heavily on returning residents and the public to the impacted area.

Restricted re-entry into a damaged area will be at the discretion of the authority having jurisdiction.

When an evacuation has been ordered, it is recommended that the IC and the EOC establish appropriate and respective recovery functions. Planning for re-entry into an evacuated or affected area should be started early during an operation to ensure all hazards have been mitigated and there is no continuing threat to the public.

Once an incident has stabilized, the need for a damage assessment and re-establishment of basic infrastructure may affect the ability to re-occupy an area. Law enforcement should be consulted to address access limitations, traffic flows, and accountability as the area is re-populated.

The IC should consider information from all recovery partners when determining whether it is safe for the public to re-enter the affected area and how it will be done.

Once it is determined that re-entry is safe, the IC will determine how re-entry of the public into the affected area will take place. The IC will often control re-entry into the impacted area for a short period of time to ensure residents can access their properties without the area being open to the public. Public information announcements will be made regarding the re-entry operations.

A pre-established credentialing and re-entry process will allow the IC to control entry into the area, maintain scene and site security, and disseminate public information to media and evacuees promptly.

Re-entry will be scheduled by priority as listed below or at the direction of the controlling authority.

1. Emergency services, Public Works/Road and Bridge, utility and damage assessment officials
2. Residents
3. Non-resident personnel (insurance adjusters, repair personnel, etc.)
4. Unrestricted access

### **11.16 Incident Termination and Demobilize**

Once the incident has been terminated, the demobilization process of releasing resources and equipment is scalable depending on the size of the incident. The demobilization of personnel or equipment should be approved by the IC or designee and properly documented.

## **12 TRANSPORTATION RESOURCE ASSESSMENT AND NEEDS**

The ability to identify and allocate transportation resources can be an essential function during an emergency situation for the City of Glenwood Springs and Garfield County. The following agencies/organizations may be able to assist, and the procedure to request these assets is described below.

## 12.1 Roaring Fork Transportation Authority (RFTA)

The IC will request RFTA bus services either directly or through the GCECA. Contact will be made to the Transportation Director either directly or through RFTA's dispatch center. The request should include the objective, the number of buses needed, the method of communication to be used, where to report, and who to contact for further directions and assignments. Each asset used will not leave the incident assignment until the IC or designee relieves them from the incident.

## 12.2 RE-1 School District

The IC will request RE-1 bus services either directly or through the GCECA. Contact will be made to the Transportation Director. The request should include the objective, the number of buses needed, a method of communication to each driver, where to report, and who to contact for further directions and assignments. Each asset used will not leave the incident assignment until the IC or designee relieves them from the incident.

## 12.3 Rafting Companies

The IC will request bus services either directly or through the GCECA. Contact will be made to Glenwood Adventure Company and/or Blue Sky Adventures. The request should include the objective, the number of buses needed, a method of communication to each driver, where to report, and who to contact for further directions and assignments. Each asset used will not leave the incident assignment until the IC or designee relieves them from the incident.

# 13 VULNERABLE AND SPECIAL NEEDS POPULATIONS

Residents with special needs may require additional support when evacuating. Populations requiring assistance may include assisted living facilities, Valley View Hospital (VVH), isolated people with significant health and mobility concerns, or residents without transportation. Excluding the assisted living facilities and VVH, Garfield County Public Health will coordinate with organizations in the county that do home health visits to maintain an internal vulnerable population list. These organizations will be the main contacts in the event of an evacuation.

Often residents who need assistance evacuating call 911 for help. If this occurs the GCECA will advise the IC/UC who will, in turn, provide appropriate resources if possible. When activated, the EOC can assist in coordinating those requests with available local, county, state, and federal resources.

A key to successfully evacuating vulnerable populations is neighborhood preparedness. It is understood that the first and best option for evacuating those who live at home without family or transportation support will be concerned neighbors and friends.

Assisted living facilities and VVH should maintain evacuation plans for their populations. To ensure the safety of everyone, staff responsible for those facilities should not delay implementing their evacuation plans. It is recommended to issue evacuation notices early to all these types of facilities to allow time for evacuations to take place.

If an EOC is activated, it is recommended that a representative from VVH and Garfield County Public Health respond to the EOC to act as liaison and provide evacuation and incident information for those populations.

Evacuation of those without transportation should be considered a priority. Evacuee collection points may be required. In the event collection points are needed, the IC/UC shall coordinate resources for those evacuees and transport them to the nearest emergency shelter.

### 13.1 School Evacuations

There are nine public schools within the boundaries of this plan. Per city and state requirements, schools maintain emergency plans that outline their response to natural and manmade disasters. Due to the highly complex nature of evacuating a school while it is in session, the policy of most schools is to shelter their students in place whenever possible. The school districts or independent schools may order their staff to shelter in place independently or at the recommendation of the IC or the EOC. In the event a school must be evacuated, staff shall follow school policies and procedures and manage their evacuation operations following those plans.

Some schools have evacuation plans in place that identify locations to which students may be transported, see **Table 11**. Schools are responsible for activating internal emergency notification procedures for parents and staff. In the event of a school evacuation, schools are advised to notify the appropriate authorities, law enforcement, or emergency management to begin coordinating operations. This coordination will include the identification of student reunification sites, the route to reunification sites, student pick-up locations, and special instructions provided to responsible adults. The IC/UC or EOC will assist when needed or requested by the area schools. Local emergency leaders are encouraged to actively review and coordinate evacuation plans for schools within their jurisdictions. For additional information on each school, see APPENDIX G: **APPENDIX G: SCHOOL RESOURCE & CONTACT INFORMATION**.

**Table 11. School Evacuation Summary**

| School                             | Evacuation Plan (Y/N) | Transportation Needed (Y/N) | Re-Unification Sites Identified (Y/N) |
|------------------------------------|-----------------------|-----------------------------|---------------------------------------|
| Two Rivers Community School        | Y                     | N                           | Y                                     |
| Riverview K8 School                | Y                     | N                           | Y                                     |
| Glenwood Springs Middle School     | Y                     | N                           | Y                                     |
| Yampa Mountain School              | Y                     | N                           | Y                                     |
| Glenwood Springs Elementary School | Y                     | N                           | Y                                     |
| Glenwood Springs High School       | Y                     | N                           | Y                                     |
| St. Stephen Catholic School        | Y                     | Y                           | TBD                                   |
| Sopris Elementary School           | Y                     | N                           | Y                                     |
| Colorado Mountain College          | Y                     | N                           | TBD                                   |

## 13.2 Assisted Living Facilities

Residents within the boundary of the Glenwood Springs Fire Department may have functional needs that may require additional support when evacuating. Assisted living facilities should maintain evacuation plans for their residents. The need for evacuation notices to those facilities will be determined by the IC as soon as possible. This information may be provided by an Everbridge notification or direct contact from the GCECA. If needed, the IC or EOC will collaborate with each facility's emergency contact to provide pertinent information and assess the needs of that facility. To ensure residents are safe, staff responsible for those facilities should not delay implementing their evacuation plans. Assisted living facilities are listed in **APPENDIX H: VULNERABLE POPULATION FACILITIES**.

## 13.3 Valley View Hospital

Valley View Hospital (VVH) is an independent, nonprofit health system with a 21-acre medical campus with 78 beds and an additional 400,000 square feet of advanced hospital and medical offices. VVH has an active evacuation plan and will be proactive in patient removal when needed. They mobilize an internal Incident Command to start moving patients upon notification. All internal communication for VVH will be dictated by their local plan for patient tracking and notifications. Patient conditions are identified by a color code, and they will discharge many walking patients home or with family. VVH has an MOU in place with RFTA for transporting patients. The Cancer Center entrance on Blake Avenue is the main pick-up location. RFTA has a designated evacuation route utilizing 20<sup>th</sup> Street, Blake Ave., and 19<sup>th</sup> Street, see evacuation routes for details.

Ambulatory patient ground transportation will utilize the Emergency Department entrance. Ground transportation assets consist of local Fire/EMS agencies, EMS Unlimited, Eagle County Paramedics, and Aspen Valley Hospital. VVH will contact other medical facilities directly to arrange patient relocation.

Most air transport will utilize Classic Air Medical (Western Slope), Care Flight (Grand Junction and Northern CO), and Flight for Life (Front Range). Transports by air will be one patient per air ambulance. Classic and Care Flight can have 5-8 air ambulances within a one-hour time frame. Air ambulances will drop at the nearest hospital/medical center and return for more patient transports as needed. Fixed-wing transports will be from Rifle Garfield County Airport via ground transport. Coordination through air operations with air ambulance pilots will be coordinated with the IC or EOC. Air Ambulances will need to check any flight restrictions before departure.

VVH can be used as a shelter for community populations; however, this should be a last resort. Hospital surges will naturally occur during an emergency and the ability to take on a greater population is limited.

During a power outage, VVH can run for 5-6 days based on the current burn rate of generators, and if they curtail resources the facility can run for a longer period of time.

For emergency notification, call the "House Supervisor" phone at [REDACTED]. Valley View Hospital can also be contacted via DTR radio on the VVH HOSP channel, and the Emergency Manager Director can monitor [REDACTED] for direct contact.

If an EOC is set up, Valley View Hospital can send a representative to help liaison with hospital staff, priorities, and transportation issues.

### 13.4 Tourist Populations

Evacuation of the tourist population will occur with the general population, and they will self-evacuate along with the community. Some areas have detailed evacuation plans while others do not. Each tourist facility should have critical staff members signed up to receive Everbridge alerts so that they receive notifications and updates promptly. To notify non-Garfield County residents of an emergency/hazardous situation, the CGECA can be contacted by the IC to send out a text alert with a corresponding event code, i.e., GARCORADS.

Some tourist facilities may have transportation requirements, i.e., The Glenwood Adventure Park, to facilitate an evacuation. If that is the case, each facility should have a transportation plan and if additional transportation is needed, they will need to contact the IC/UC for assistance.

The Glenwood Chamber Resort Association can be used as a liaison between Everbridge emergency notifications and Glenwood Springs businesses and the visitor population. They can utilize information sharing from the IC and/or PIO to disseminate critical emergency and travel information to visitors through their website.

## 14 EMERGENCY SHELTERS / HEATING & COOLING CENTERS

Shelters must be opened as soon as possible so evacuees or those who need heating and cooling facilities may go to for information and assistance. Locations of designated shelters will be determined largely by the type and location of the event or emergency.

If it is determined that sheltering or a heating and cooling center is needed, the IC/UC can make this request through the GCECA. The IC/UC shall identify what shelter(s) will be needed, and coordinate activities with those selected shelters before designating them as “Open.” During the coordination effort, the IC or designee will determine who is the primary contact for the facility, identify what agency/organization will complete the check-in / check-out process, and coordinate other requests during sheltering operations.

Shelter location information shall be widely disseminated by the incident PIO with support from the EOC if activated.

A Heating and Cooling Center can be activated during periods of extreme heat or cold temperatures, power outages, or rolling utility blackouts. These centers provide for resident safety and a place of comfort. These types of centers provide the community restrooms, food and beverage, and information. See **APPENDIX F: SHELTERS / HEATING & COOLING CENTERS**.

## 14.1 Cooling Center Triggers and Activation

The City of Glenwood Springs monitors for any combination of anticipated prolonged power outages and excessive heat watch issued 2-3 days out (will transition to heat advisory or excessive heat warning @ 24 hours) primarily from June through mid-September with a special focus on July and August. This is a regional forecast for the Grand Valley so the city will have to interpret what it may mean locally. The city also monitors iNWS warnings and will receive a notification (24 hours in advance) from Excel/PSCO stating they need to shut down a particular power draw in the city over a certain duration of time.

The activation of a cooling center begins with the mobilization of a cooling center team. Once the team is identified, the IC is established. The IC determines action items involving public notification, estimated time frame, daily time frame, facility specifics, power grid triage, generator hook-up (if needed), logistical needs, and ongoing public information.

The IC and the consultant team will determine when to deactivate and/or demobilize a cooling center by analyzing a combination of weather patterns and anticipating the power system returning to normal.

### Sources of information for cooling center triggers and activation:

1. GWS Historical Temp Trends:  
<https://www.extremeweatherwatch.com/cities/glenwood-springs/year-2021>
2. Experimental Heat Risk: <https://www.wrh.noaa.gov/wrh/heatrisk/#close>
3. iNWS Warnings: Limited access sign up at <https://inws.ncep.noaa.gov/>
4. Combination of weather events and potential power outages

## 14.2 Heating Center Triggers and Activation

Throughout the winter months, October through March, the City of Glenwood Springs and Garfield County may experience periods of extreme cold temperatures or a loss of resources that provide heat to community members. The City of Glenwood Springs monitors the Winter Storm Severity Index and the NWS forecast and warnings. **Table 12** is the Potential Winter Storm Index. It can be used as a guide for the activation of a heating center.

The activation of a heating center begins with the mobilization of a heating center team. Once the team is identified, the IC is established. The IC determines action items involving public notification, estimated time frame, daily time frame, facility specifics, power grid triage, generator hook-up (if needed), logistical needs, and ongoing public information.

The IC and the established Glenwood Springs consultant team will determine when to deactivate and/or demobilize a heating center by analyzing a combination of weather patterns and NWS forecasting,



**Table 12. Winter Storm - Potential Storm Impacts**

| <b>Potential Winter Storm Impacts</b> |                                                                                                                                                                                                                                                                                           |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       | <b>Winter Weather Area</b><br><b>Expect Winter Weather</b><br>Winter driving conditions. <b>Drive carefully.</b>                                                                                                                                                                          |
|                                       | <b>Minor Impacts</b><br><b>Expect a few inconveniences to daily life.</b><br>Winter driving conditions. <b>Use caution while driving.</b>                                                                                                                                                 |
|                                       | <b>Moderate Impacts</b><br><b>Expect disruption to daily life.</b><br>Hazardous driving conditions. <b>Use extra caution while driving.</b><br>Closures and disruptions to infrastructure may occur.                                                                                      |
|                                       | <b>Major Impacts</b><br><b>Expect considerable disruptions to daily life.</b><br>Dangerous or impossible driving conditions.<br><b>Avoid travel if possible.</b><br>Widespread closures and disruptions to infrastructure may occur.                                                      |
|                                       | <b>Extreme Impacts</b><br><b>Expect substantial disruptions to daily life.</b><br>Extremely dangerous or impossible driving conditions. <b>Travel is not advised.</b><br>Excessive widespread closures and disruptions to infrastructure may occur.<br>Life-saving actions may be needed. |

## 15 AFTER ACTION REVIEW AND REPORT

The primary purpose of an after-action review (AAR) is to identify successes and deficiencies in the response plan and determine necessary actions to correct the deficiencies or repeat successes. The AAR can often reveal which response procedures, equipment, and techniques were effective, which were not, and the reason(s) why. These reviews can lead to “lessons learned” and should be reflected in the response plan, training efforts, and future exercise objectives. They also create a culture of continuous performance improvement and adaptive learning.

At a minimum, AAR checklists should include:

- Type of AAR to conduct (debrief, hot wash, formal, informal, internal, external).
- Determine a lead or team to conduct the AAR.
- Conduct and compile research on the incident and review all relevant information.
- Identify key stakeholders.
- Invite stakeholders and solicit input (in person/virtual/phone).
- Develop findings, highlight successes, provide lessons learned, and make recommendations.
- Communicate findings to all stakeholders.
- Implement lessons learned and recommendations.

Scheduling and completing an AAR should be done immediately after an incident and no later than two weeks if possible. Triggers for AARs should be fluid and the request for an AAR can be requested from any invested stakeholder.

## 16 TRAINING

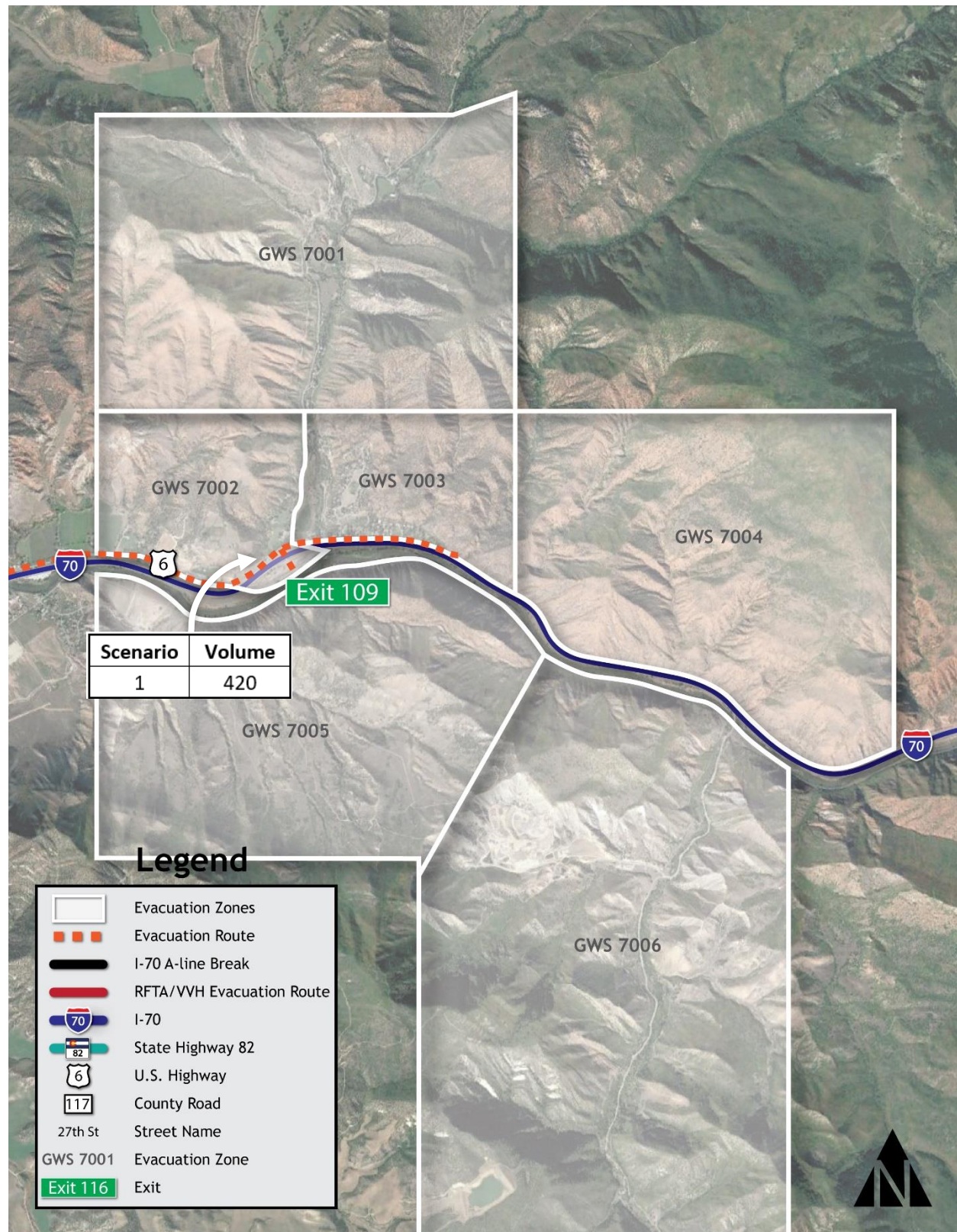
Training regarding the Emergency Operations / Traffic Emergency Management Plan is recommended to provide all responders and stakeholders an opportunity to refresh their knowledge and increase their awareness and capabilities. Senior leadership should work towards continuous training to assess capabilities and strategies that may lead to plan updates and revisions.

Hot washes along with table-top and functional exercises are valuable metrics of plan implementation. They offer a dual benefit of assessing the plan itself and an agency's understanding of their respective duties during plan execution. Training tools can be located in Homeland Security's "Homeland Security Exercise and Evaluation Program (HSEEP)", January 2020. [Homeland Security Exercise and Evaluation Program \(HSEEP\) \(fema.gov\)](https://www.fema.gov/hseep)

## 17 APPENDICES

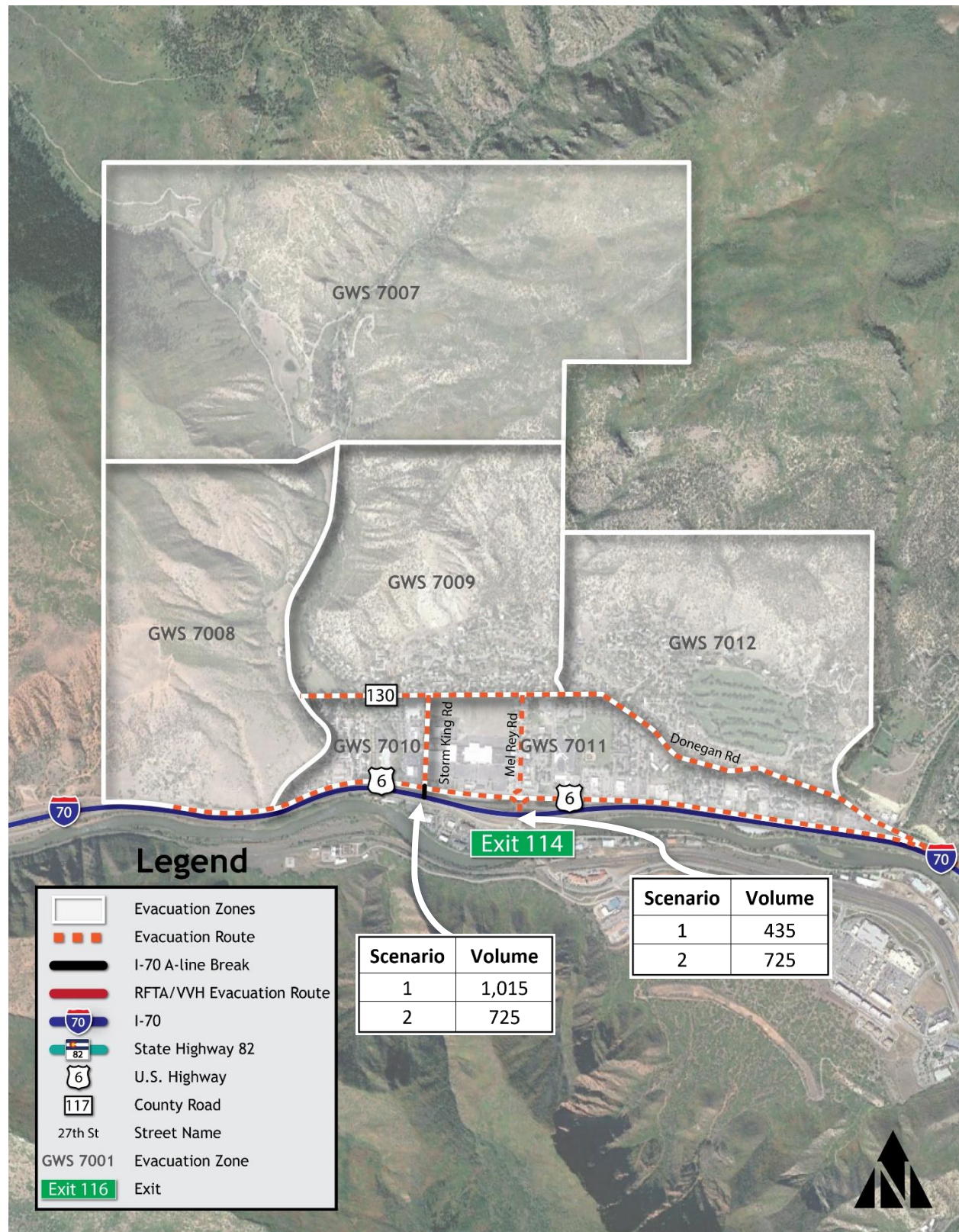
## APPENDIX A: EVACUATION GUIDE

|                                                                   |                                                                                                                                                                                                                       |                                  |                                                                                                                                      |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                                 | Canyon Creek/South Canyon<br>5 Zones                                                                                                                                                                                  | Zones                            | Zones GWS 7001-7006                                                                                                                  |
| City                                                              | N/A                                                                                                                                                                                                                   | County                           | Garfield                                                                                                                             |
| Communities                                                       | -Upper Canyon Creek<br>-Lower Canyon Creek<br>-Canyon Creek Estates<br>-Colorado Parks and Wildlife                                                                                                                   | Areas of<br>Refuge/Safe<br>Zones | -New Creation Church<br>-Colorado Parks and Wildlife<br>Office<br>-Orchard Creek Ranch<br>-Canyon Creek Estates<br>Neighborhood Park |
| Law Enforcement                                                   | Garfield County SO,<br>Colorado State Patrol,<br>Colorado Parks and Wildlife                                                                                                                                          | Fire Protection<br>District      | Glenwood Springs FD                                                                                                                  |
| Evacuation Routes -<br>other routes may be<br>developed if needed | <b>Primary:</b><br>WB US 6 > I-70<br><b>Alternate:</b><br>WB US 6 towards New Castle                                                                                                                                  |                                  |                                                                                                                                      |
| Critical Facilities                                               | -Colorado Parks and Wildlife<br>-South Canyon Municipal Landfill                                                                                                                                                      |                                  |                                                                                                                                      |
| Critical Intersections<br>to Control                              | -Canyon Creek Drive @ US 6<br>-I-70 @ Exit 109 (Canyon Creek)                                                                                                                                                         |                                  |                                                                                                                                      |
| Special Considerations<br>for this Zone                           | It may be necessary to close I-70 or reduce to one lane at the on-ramps of Exit 109 (Canyon Creek). Westbound US 6 to New Castle is an additional option for egress traffic.                                          |                                  |                                                                                                                                      |
| Estimated Number of<br>Vehicles to Evacuate<br>(2030)             | 420                                                                                                                                                                                                                   |                                  |                                                                                                                                      |
| Estimated Population<br>(2030)                                    | Unknown                                                                                                                                                                                                               |                                  |                                                                                                                                      |
| Evacuation Scenarios                                              | Scenario 1 <ul style="list-style-type: none"> <li>100% of traffic is led on US 6 to I-70 On-Ramp at Exit 109.</li> </ul> *If traffic exceeds capacity on this roadway, vehicles can be sent WB on US 6 to New Castle. |                                  |                                                                                                                                      |



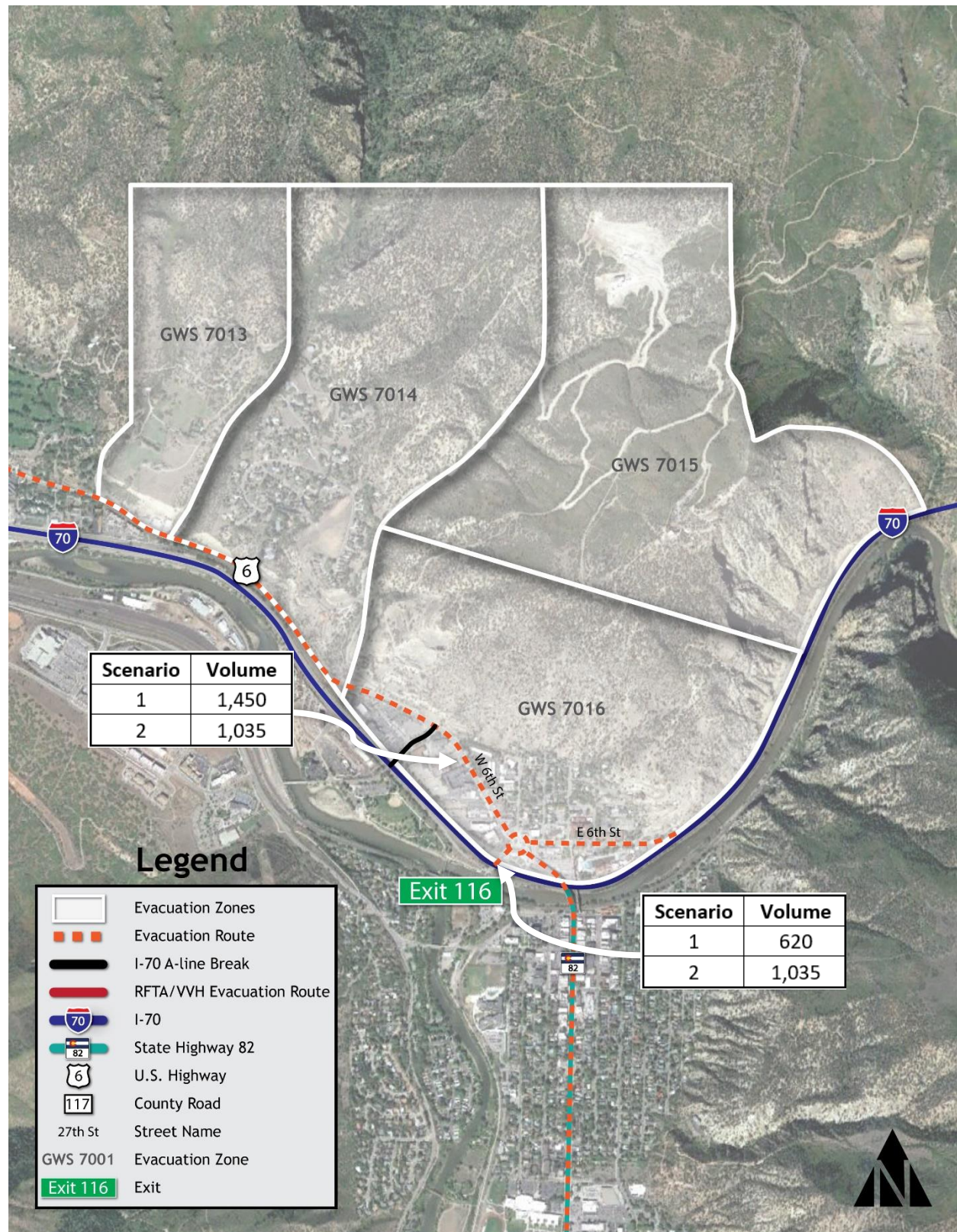


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|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                           | Mitchell Creek/West Glenwood Springs<br>6 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Zones                      | Zones GWS 7007-7012                                                                                                                    |
| City                                                        | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | County                     | Garfield                                                                                                                               |
| Communities                                                 | -Mitchell Creek<br>-Ami's Acres<br>-West Glenwood North of I-70 & East to Sunny Acres Rd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Areas of Refuge/Safe Zones | -Upper Mitchell Creek Open Ranch Land<br>-Diemoz Pasture<br>-Glenwood Springs Mall<br>-GSMS Ball Fields<br>-Glenwood Springs Golf Club |
| Law Enforcement                                             | Garfield County SO,<br>Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Fire Protection District   | Glenwood Springs FD                                                                                                                    |
| Evacuation Routes - other routes may be developed if needed | <b>Primary:</b><br>Donegan Rd > Storm King Rd Access Pt. /Mel Ray Road > US 6 > I-70<br><b>Alternate:</b><br>Donegan Rd > US 6 > West 1 <sup>st</sup> Access Pt. > I-70<br><b>Alternate:</b><br>Donegan Rd > US 6 > Grand Ave. > SH 82                                                                                                                                                                                                                                                                                                                                                         |                            |                                                                                                                                        |
| Critical Facilities                                         | -Two Rivers School<br>-Glenwood Springs Fire Station #1<br>-Glenwood Springs Middle School                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            |                                                                                                                                        |
| Critical Intersections to Control                           | -Storm King Rd @ US 6<br>-Mel Ray Rd/US 6 Roundabout<br>-Donegan Rd @ US 6<br>-Storm King Rd Access Point @ I-70<br>-West 6 <sup>th</sup> St @ West 1 <sup>st</sup> St<br>-West 1 <sup>st</sup> St Access Point @ I-70                                                                                                                                                                                                                                                                                                                                                                         |                            |                                                                                                                                        |
| Special Considerations for this Zone                        | Follow access line break procedure. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County), and SH 82 at CR 154 (MP 5). Evacuate by evacuation zones based on the direction of the hazard/threat. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes.                                                                                                                                                                                                              |                            |                                                                                                                                        |
| Estimated Number of Vehicles to Evacuate (2030)             | 1,450                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                            |                                                                                                                                        |
| Estimated Population (2030)                                 | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                            |                                                                                                                                        |
| Evacuation Scenarios                                        | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led on Donegan Rd to Storm King Rd Access Point to I-70.</li> <li>30% of traffic is led on Donegan Rd to Mel Ray Rd to I-70 On-Ramp at Exit 114.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>50% of traffic is led on Donegan Rd to Storm King Rd Access Point to I-70.</li> <li>50% of traffic is led on Donegan Rd to Mel Ray Rd to I-70 On-Ramp at Exit 114.</li> </ul> *If traffic exceeds capacity on these roadways', vehicles can be sent EB on US 6 to West 1 <sup>st</sup> Access Point to I-70. |                            |                                                                                                                                        |



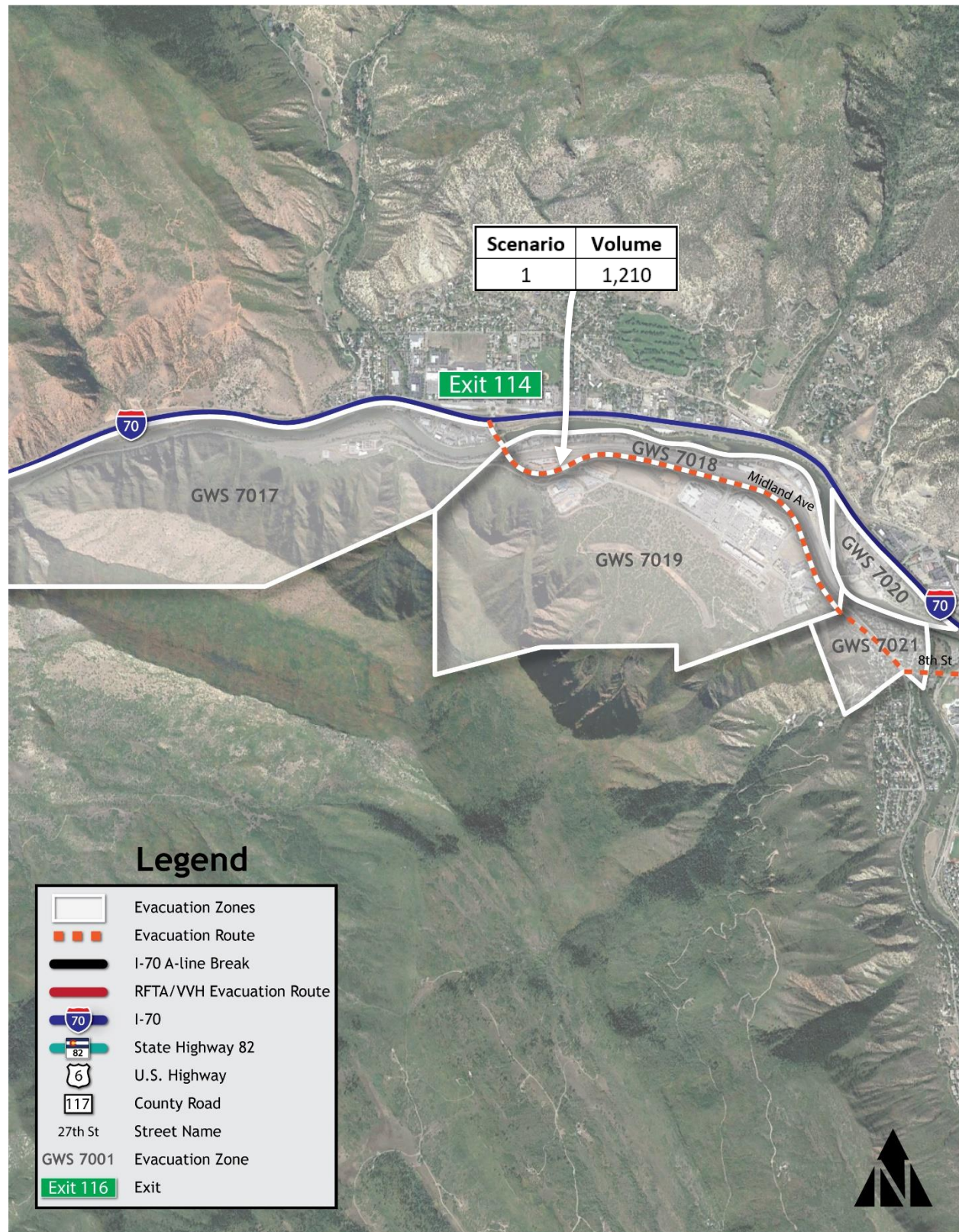


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|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                           | Highlands/Oasis Creek/6 <sup>th</sup> St Area<br>4 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Zones                      | Zones GWS 7013-7016                                                                                                         |
| City                                                        | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | County                     | Garfield                                                                                                                    |
| Communities                                                 | -Highlands<br>-Oasis Creek<br>-Glenwood Caverns Adventure Park                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Areas of Refuge/Safe Zones | -Highlands Ranchland<br>-Oasis Creek Park<br>-Transfer Trail Parking Lot<br>-RMR Quarry<br>-Glenwood Caverns Adventure Park |
| Law Enforcement                                             | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Fire Protection District   | Glenwood Springs FD                                                                                                         |
| Evacuation Routes - other routes may be developed if needed | <b>Primary:</b><br>US 6 > West 1 <sup>st</sup> Access Point > I-70<br><b>Alternate:</b><br>US 6 > I-70 (Exit 116)<br><b>Alternate:</b><br>US 6 > Grand Ave > SH 82 South/East                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                                                                                                                             |
| Critical Facilities                                         | -Glenwood Center for the Arts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                                                                                                                             |
| Critical Intersections to Control                           | -Donegan Rd @ US 6<br>-West 6 <sup>th</sup> St @ West 1 <sup>st</sup> St<br>-West 1 <sup>st</sup> St Access Point @ I-70<br>-6 <sup>th</sup> St @ I-70 Roundabout<br>-Grand Ave @ 6 <sup>th</sup> St Traffic Light                                                                                                                                                                                                                                                                                                                                                                         |                            |                                                                                                                             |
| Special Considerations for this Zone                        | Follow access line break procedure. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5). Evacuate by evacuation zones based on the direction of hazard/threat. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes.                                                                                                                                                                                                               |                            |                                                                                                                             |
| Estimated Number of Vehicles to Evacuate (2030)             | 2,070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                            |                                                                                                                             |
| Estimated Population (2030)                                 | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                                                                                                             |
| Evacuation Scenarios                                        | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led EB on Donegan Rd &amp; US 6 to West 1<sup>st</sup> Access Point to I-70.</li> <li>30% of traffic is led EB on Donegan Rd &amp; US 6 to I-70 On-Ramp at Exit 116.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>50% of traffic is led EB on Donegan Rd &amp; US 6 to West 1<sup>st</sup> Access Point to I-70.</li> <li>50% of traffic is led EB on Donegan Rd &amp; US 6 to I-70 On-Ramp at Exit 116.</li> </ul> *If traffic exceeds capacity on these roadways', vehicles can be sent SB on SH 82. |                            |                                                                                                                             |



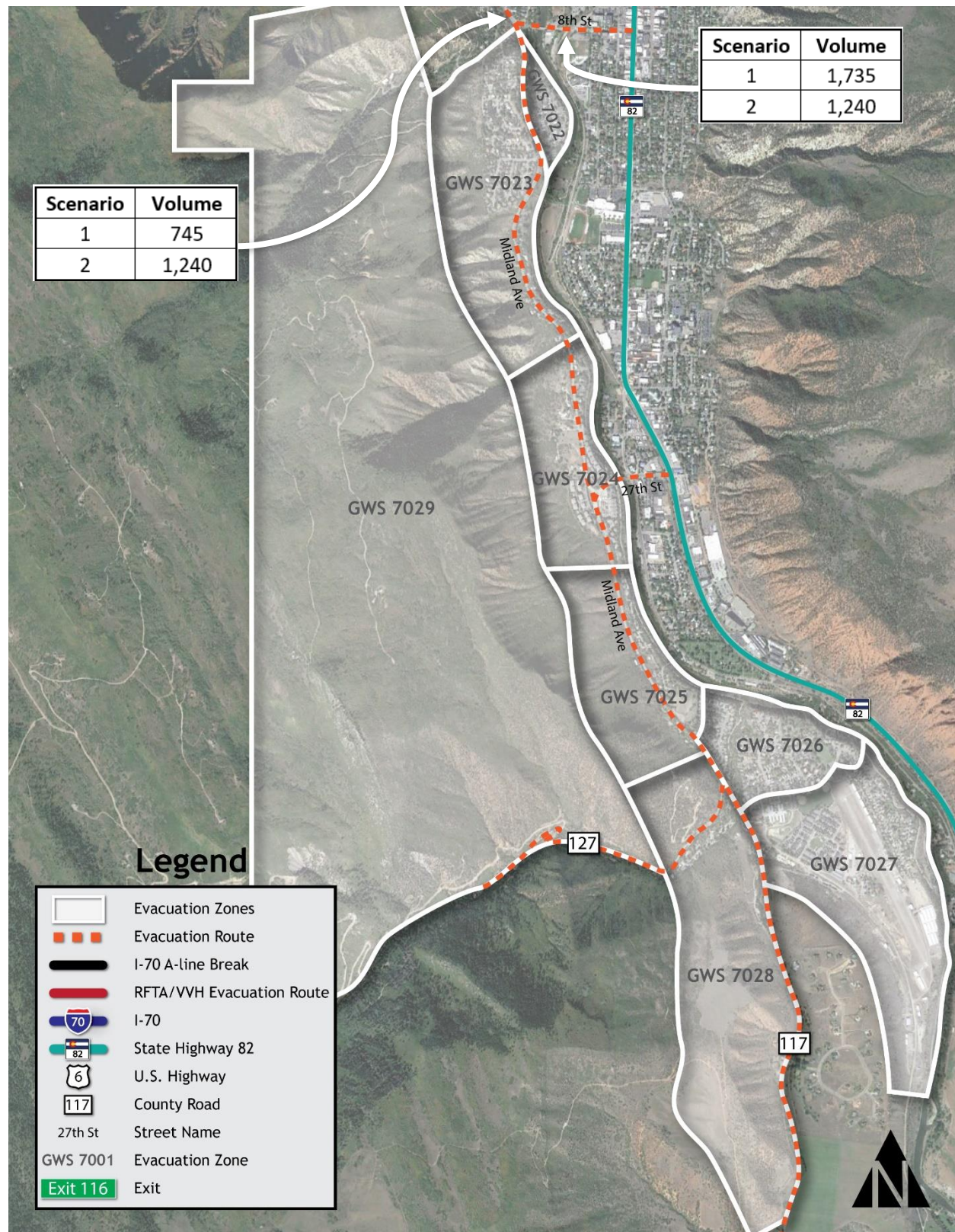
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|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------|
| Zone Name & Count                                                 | Glenwood Meadows<br>5 Zones                                                                                                                                                                                                                                                                                                                                                                                                           | Zones                            | Zones GWS 7017-7021               |
| City                                                              | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                      | County                           | Garfield                          |
| Communities                                                       | -Glenwood Meadows<br>-Devereux Business<br>-Two Rivers Park                                                                                                                                                                                                                                                                                                                                                                           | Areas of<br>Refuge/Safe<br>Zones | -Meadows Mall<br>-Two Rivers Park |
| Law Enforcement                                                   | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                   | Fire Protection<br>District      | Glenwood Springs FD               |
| Evacuation Routes -<br>other routes may be<br>developed if needed | <b>Primary:</b><br>Midland Ave > I-70 (Exit 114)<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > I-70 (Exit 116)<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > SH 82 South/East                                                                                                                                                                                                       |                                  |                                   |
| Critical Facilities                                               | -Glenwood Springs Water Treatment Plant<br>-Glenwood Springs Wastewater Treatment Plant<br>-City Fleet Maintenance<br>-Roaring Fork Transportation Authority<br>-Electrical Operations Center<br>-Natural Grocers<br>-CSP/CDOT Complex<br>-Glenwood Springs Community Center<br>-Yampa Mountain High School                                                                                                                           |                                  |                                   |
| Critical Intersections<br>to Control                              | -Midland/I-70 Roundabout<br>-Midland Ave @ 8 <sup>th</sup> St<br>-8 <sup>th</sup> St @ Grand Ave<br>-6 <sup>th</sup> St @ I-70 Roundabout<br>-Grand Ave @ 6 <sup>th</sup> St Traffic Light                                                                                                                                                                                                                                            |                                  |                                   |
| Special Considerations<br>for this Zone                           | Trails behind Glenwood Meadows may have cyclists or pedestrians. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes. Traffic control may be needed to access I-70 at Exit 114 (West Glenwood) and Exit 116 (Glenwood). It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5). |                                  |                                   |
| Estimated Number of<br>Vehicles to Evacuate<br>(2030)             | 1,210                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |                                   |
| Estimated Population<br>(2030)                                    | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |                                   |
| Evacuation Scenarios                                              | Scenario 1 <ul style="list-style-type: none"> <li>100% of traffic is led NB on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> *If traffic exceeds capacity on this roadway, vehicles can be sent SB on Midland Ave, EB on 8 <sup>th</sup> St, then either SB on SH 82 or NB on SH 82 to I-70 Exit 116.                                                                                                                           |                                  |                                   |





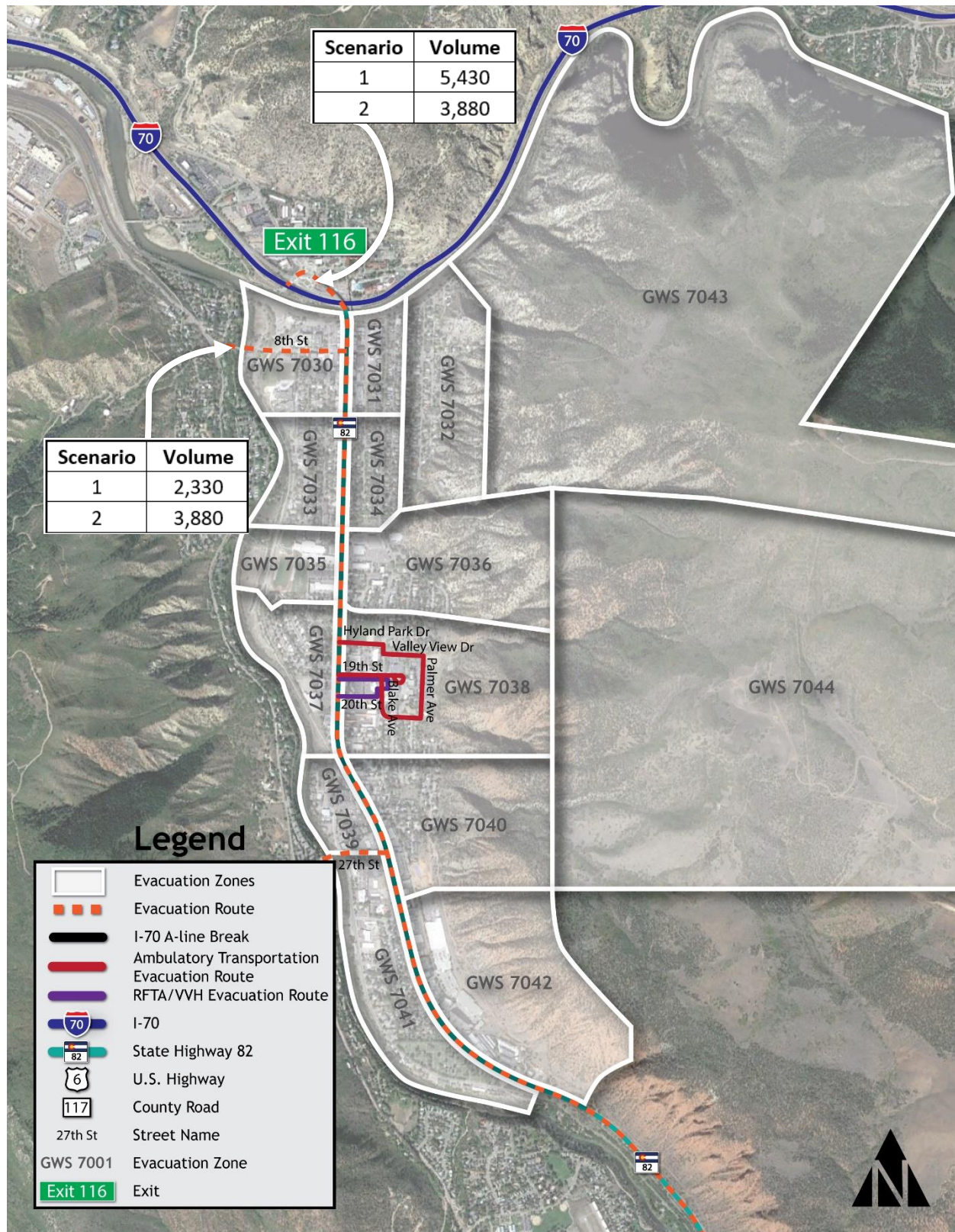
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|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                                 | Midland Avenue Corridor<br>8 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Zones                            | Zones GWS 7022-7029                                                                                               |
| City                                                              | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | County                           | Garfield                                                                                                          |
| Communities                                                       | -Midland Ave.<br>-3-Mile<br>-Cardiff                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Areas of<br>Refuge/Safe<br>Zones | -Veltus Park<br>-Old Cardiff Bridge Rd<br>-Sopris Elementary School<br>-Sullivan Park<br>-Paraglider Landing Zone |
| Law Enforcement                                                   | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Fire Protection<br>District      | Glenwood Springs FD                                                                                               |
| Evacuation Routes -<br>other routes may be<br>developed if needed | <b>Primary:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > I-70 (Exit 116)<br><b>Alternate:</b><br>Midland Ave > 27 <sup>th</sup> St > South Glen Ave > SH 82/I-70 (Exit 116)<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > I-70 (Exit 114)                                                                                                                                                                                                                                                                                                                                                                                                                     |                                  |                                                                                                                   |
| Critical Facilities                                               | -Red Mountain Water Treatment Plant<br>-Sopris Elementary School<br>-Glenwood Springs Municipal Airport<br>-Black Hills Energy<br>-Street/SWAT Facility<br>-Holy Cross Energy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |                                                                                                                   |
| Critical Intersections<br>to Control                              | -Grand Ave @ 6 <sup>th</sup> St Traffic Light<br>-6 <sup>th</sup> St @ I-70 Roundabout<br>-Midland Ave @ 27 <sup>th</sup> St Roundabout<br>-27 <sup>th</sup> St Roundabout @ South Grand Ave<br>-27 <sup>th</sup> St @ South Glen Ave                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |                                                                                                                   |
| Special<br>Considerations for<br>this Zone                        | Red Mountain trails may have cyclists or pedestrians. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes. The 27 <sup>th</sup> Street roundabouts need to be monitored by traffic control personnel. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5).                                                                                                                                                                                                                                                                             |                                  |                                                                                                                   |
| Estimated Number of<br>Vehicles to Evacuate<br>(2030)             | 2,480                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |                                                                                                                   |
| Estimated Population<br>(2030)                                    | 3,200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |                                                                                                                   |
| Evacuation Scenarios                                              | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>50% of traffic is led NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>50% of traffic is led NB on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> *If traffic exceeds capacity on these roadways, vehicles can be sent SB on Midland Ave, EB on 27 <sup>th</sup> St, then either SB on SH 82 or NB on SH 82 to I-70 Exit 116. |                                  |                                                                                                                   |





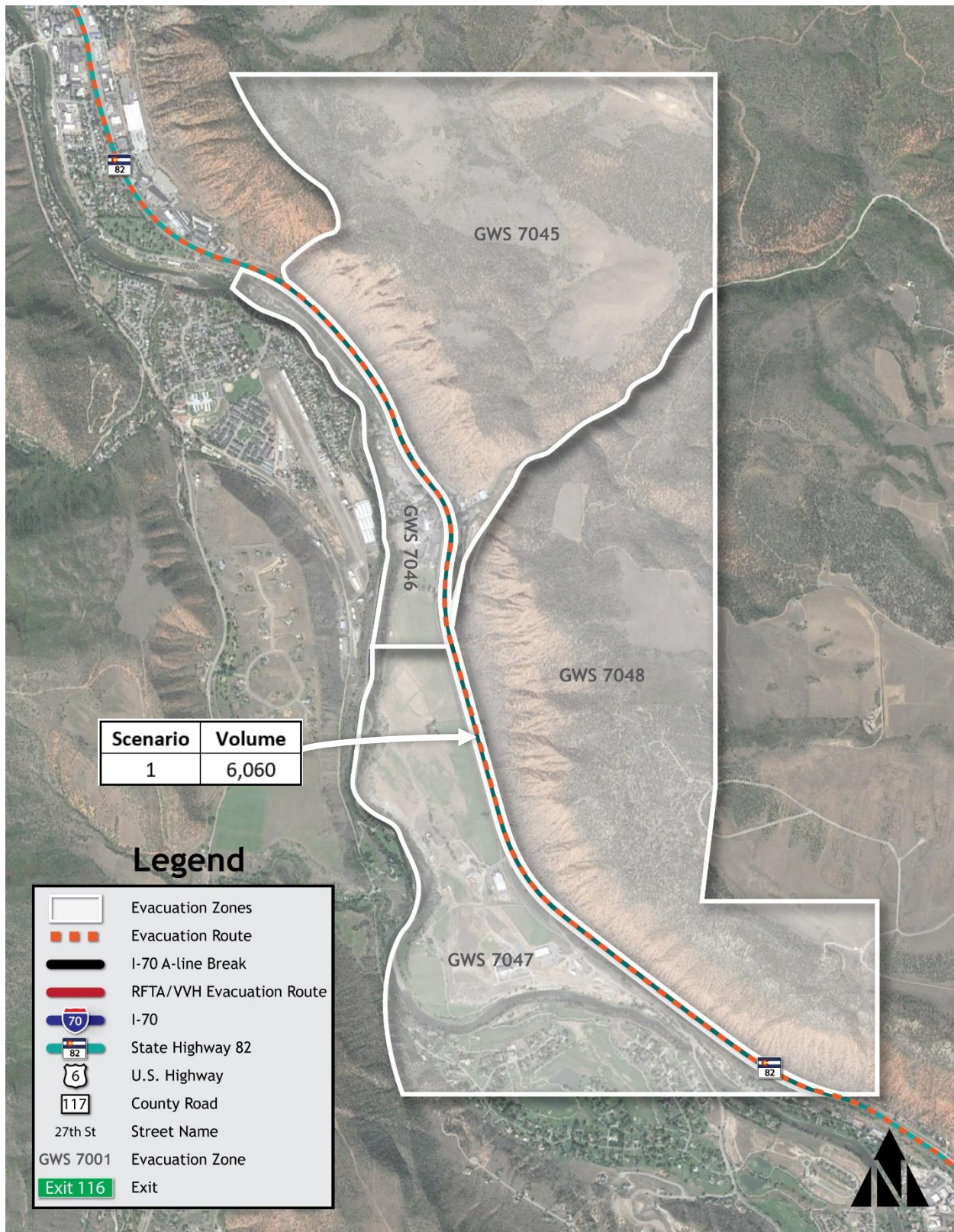
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| <b>Zone Name &amp; Count</b>                                          | Downtown/South GWS<br>15 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Zones</b>                      | Zones GWS 7030-7044                     |
| <b>City</b>                                                           | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>County</b>                     | Garfield                                |
| <b>Communities</b>                                                    | -Downtown<br>-South GWS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Areas of Refuge/Safe Zones</b> | -Sayre Park<br>-Paraglider Landing Zone |
| <b>Law Enforcement</b>                                                | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Fire Protection District</b>   | Glenwood Springs FD                     |
| <b>Evacuation Routes</b><br>- other routes may be developed if needed | <b>Primary:</b><br>Grand Ave > 6 <sup>th</sup> St > I-70 (Exit 116)<br><b>Alternate:</b><br>Grand Ave > 8 <sup>th</sup> St > Midland Ave > I-70 (Exit 114)<br><b>Alternate:</b><br>Grand Ave > SH 82 South/East                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |                                         |
| <b>Critical Facilities</b>                                            | <div>             -GWS Elementary School<br/>             -GWS Police Department<br/>             -GWS City Hall<br/>             -Garfield County Sheriff's Office &amp; Jail<br/>             -Garfield County Courthouse<br/>             -Garfield County Admin. Annex<br/>             -Garfield Administration Building<br/>             -Garfield County Human Resources<br/>             -GWS Post Office<br/>             -CMC Administration           </div> <div>             -GWS Branch Library<br/>             -GWS Fire Station #2<br/>             -GWS Amtrak Station<br/>             -US Forest Service<br/>             -GWS Recycle Center<br/>             -GWS High School<br/>             -Grocery Store<br/>             -CMC Glenwood Center<br/>             -Saint Stephen Catholic School &amp; Parish Center<br/>             -Valley View Hospital           </div> |                                   |                                         |
| <b>Critical Intersections to Control</b>                              | <div>             -8<sup>th</sup> St @ Grand Ave<br/>             -Grand Ave @ 6<sup>th</sup> St Traffic Light<br/>             -6<sup>th</sup> St @ I-70 Roundabout           </div> <div>             -Midland Ave @ 8<sup>th</sup> St<br/>             -Midland/I-70 Roundabout<br/>             -27<sup>th</sup> St @ South Glen Ave           </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |                                         |
| <b>Special Considerations for this Zone</b>                           | Critical facilities is high in this area. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes to both I-70 and south on SH 82 towards Carbondale. Doc Holiday Trail may have pedestrians, check trailhead. Evacuate by evacuation zones based on the direction of hazard/threat. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5).                                                                                                                                                                                                                                                                                                                                                                                                        |                                   |                                         |
| <b>Estimated Number of Vehicles to Evacuate (2030)</b>                | 7,760                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |                                         |
| <b>Estimated Population (2030)</b>                                    | 4,500<br>*The population is much lower than the expected number of vehicles to evacuate due to the large amount of infrastructure and the hotels/tourist attractions in this area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                   |                                         |
| <b>Evacuation Scenarios</b>                                           | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on SH 82, WB on 8<sup>th</sup> St, and NW on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>50% of traffic is led NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>50% of traffic is led NB on SH 82, WB on 8<sup>th</sup> St, and NW on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> *If traffic exceeds capacity on these roadways', vehicles can be sent SB on SH 82.                                                                                                                                                                                                                                                                                                            |                                   |                                         |





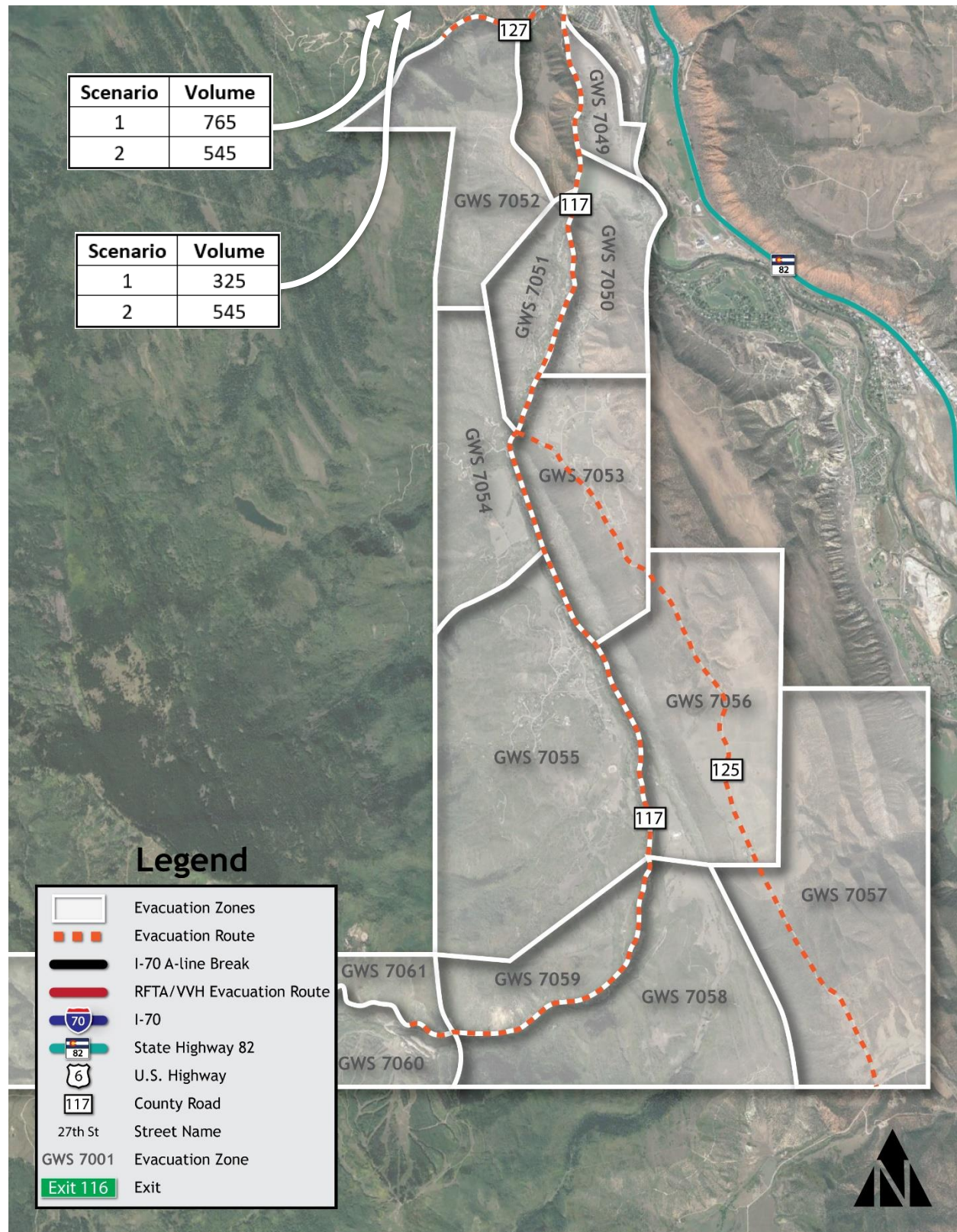
|                                                                   |                                                                                                                                                                                  |                                  |                     |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------|
| Zone Name & Count                                                 | South Grand Ave / GCR 154 Corridor<br>4 Zones                                                                                                                                    | Zones                            | Zones GWS 7045-7048 |
| City                                                              | Glenwood Springs                                                                                                                                                                 | County                           | Garfield            |
| Communities                                                       | -Garfield County<br>-South Glenwood Springs                                                                                                                                      | Areas of<br>Refuge/Safe<br>Zones |                     |
| Law Enforcement                                                   | Garfield County SO                                                                                                                                                               | Fire Protection<br>District      | Glenwood Springs FD |
| Evacuation Routes -<br>other routes may be<br>developed if needed | <b>Primary:</b><br>GCG 154 > SH 82                                                                                                                                               |                                  |                     |
| Critical Facilities                                               | -Holy Cross Energy<br>-Riverview K8 School                                                                                                                                       |                                  |                     |
| Critical Intersections<br>to Control                              | -SH 82 MP 3 @ GCR 154<br>-SH 82 MP 5 @ GCR 154                                                                                                                                   |                                  |                     |
| Special Considerations<br>for this Zone                           | It may be necessary to close SH 82 at GCR 154 (MP 5) and SH 82 @ SH 133 (Carbondale). GCR 115 (Red Canyon Road) SB traffic will need to proceed to GCR 114 (Spring Valley Road). |                                  |                     |
| Estimated Number of<br>Vehicles to Evacuate<br>(2030)             | 6,060                                                                                                                                                                            |                                  |                     |
| Estimated Population<br>(2030)                                    | Unknown                                                                                                                                                                          |                                  |                     |
| Evacuation Scenarios                                              | Scenario 1 <ul style="list-style-type: none"> <li>100% of traffic is led SB on SH 82.</li> </ul>                                                                                 |                                  |                     |





|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                                                                                                                                                                                                              |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                                    | 4-Mile Corridor<br>12 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Zones                            | Zones GWS 7049-7061                                                                                                                                                                                          |
| City                                                                 | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | County                           | Garfield                                                                                                                                                                                                     |
| Communities                                                          | -Oak Meadows<br>-Spring Ridge<br>-Ski Sunlight<br>-Black Diamond Mine<br>-Sunlight View<br>-4-Mile Ranch<br>-Cheylyn Acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Areas of<br>Refuge/Safe<br>Zones | -4-Mile Ranch<br>-Cheylyn Acres<br>-Black Diamond Mine<br>-Faranhyll Open Space<br>-Oak Meadows RV Storage Area<br>-Oak Meadows Park & Tennis Court<br>-Dry Park Rd<br>-Bersheni Ranch<br>-Sunlight Ski Area |
| Law Enforcement                                                      | Garfield County SO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Fire Protection District         | Glenwood Springs FD                                                                                                                                                                                          |
| Evacuation Routes<br>- other routes may<br>be developed if<br>needed | <b>Primary:</b><br>GCR 117 (4-Mile Rd) > Midland Ave > 27 <sup>th</sup> St > South Glen Ave > I-70/SH 82 South/East<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > 6 <sup>th</sup> St > I-70 (Exit 116)<br><b>Alternate:</b><br>GCR 117 (4-Mile Road) to GCR 125 (Dry Park Road)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |                                                                                                                                                                                                              |
| Critical Facilities                                                  | -Glenwood Springs Fire Station #3<br>-Street/SWAT Facility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                  |                                                                                                                                                                                                              |
| Critical Intersections to Control                                    | -Midland Ave @ 27 <sup>th</sup> St Roundabout<br>-27 <sup>th</sup> St @ South Grand Ave Roundabout<br>-Midland Ave @ 8 <sup>th</sup> St<br>-8 <sup>th</sup> St @ Grand Ave<br>-Grand Ave @ 6 <sup>th</sup> St Traffic Light<br>-6 <sup>th</sup> St @ I-70 Roundabout                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |                                                                                                                                                                                                              |
| Special Considerations for this Zone                                 | The 27 <sup>th</sup> Street roundabouts need to be monitored by traffic control personnel. GCR 125 (Dry Park Road) may be impassable dependent on road and weather conditions. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes to I-70, south on SH 82 towards Carbondale, and on GCR 125 towards Carbondale.                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |                                                                                                                                                                                                              |
| Estimated Number of Vehicles to Evacuate (2030)                      | 1,090                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                  |                                                                                                                                                                                                              |
| Estimated Population (2030)                                          | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |                                                                                                                                                                                                              |
| Evacuation Scenarios                                                 | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 27<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>70% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 27<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> </ul> *If traffic exceeds capacity on these roadways, vehicles can be sent on GCR 117 (4-Mile Road) to SB GCR 125 (Dry Park Road). |                                  |                                                                                                                                                                                                              |





## **Assumptions for Evacuation Volumes**

- Daily traffic volumes were received from the CDOT Statewide Model for 2015 and 2030.
- The average daily trips per household, as inferred from daily traffic volumes, was assumed to be 2 trips per day.
- For each group of zones, the largest 2030 one-way daily volume (BA\_DY\_FLOW) on the major road was documented; this volume was divided by the assumed average number of trips per vehicle per day (2 trips) to calculate the estimated number of vehicles that would be leaving these zones during an evacuation.
- All traffic within the evacuation zones will be completely redirected towards the designated evacuation routes.
- In the case of routes passing through both primary and secondary roads at a junction, the allocation of traffic will be determined based on engineering evaluations; most route volumes were split with primary routes accounting for 70% of the vehicles for scenario 1 and 50% of the vehicles for scenario 2.
- Evacuations of zone groups are assumed to be occurring without background traffic and not during other zone group evacuations.
- The evacuation duration was estimated based on the capacity of the major roadways in the zone groups (1,000 VPH for two-lane roads and 2,000 VPH for four-lane roads).

## **Zone Group Scenarios, Routes, Volumes, and Evacuation Durations**

Table 13: Zones 7001-7006 Evacuation Information

| Scenario   | Route                    | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|--------------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | WB US 6 to I-70 Exit 109 | 100%               | 420                       | 210                               | 105                               | 0.42                            | 1 hour              |

Table 14: Zones 7007-7012 Evacuation Information

| Scenario   | Route                                 | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|---------------------------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | To I-70                               | 100%               | 1450                      | 725                               | 363                               | 1.45                            | 1-2 hours           |
|            | To Storm King Rd Access Point to I-70 | 70%                | 1015                      | 508                               | 254                               | 1.02                            |                     |
|            | To Exit 114 by Mel Ray Rd             | 30%                | 435                       | 218                               | 109                               | 0.44                            |                     |
| Scenario 2 | To I-70                               | 100%               | 1450                      | 725                               | 363                               | 1.45                            | 1-2 hours           |
|            | To Storm King Rd Access Point to I-70 | 50%                | 725                       | 363                               | 181                               | 0.73                            |                     |
|            | To Exit 114 by Mel Ray Rd             | 50%                | 725                       | 363                               | 181                               | 0.73                            |                     |



Table 15: Zones 7013-7016 Evacuation Information

| Scenario   | Route                                 | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|---------------------------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | <b>To I-70</b>                        | <b>100%</b>        | <b>2070</b>               | <b>1035</b>                       | <b>518</b>                        | <b>2.07</b>                     | 2-3 hours           |
|            | US 6 to West 1st Access Point to I-70 | 70%                | 1450                      | 725                               | 363                               | 1.45                            |                     |
|            | US 6 to I-70 Exit 116                 | 30%                | 620                       | 310                               | 155                               | 0.62                            |                     |
| Scenario 2 | <b>To I-70</b>                        | <b>100%</b>        | <b>2070</b>               | <b>1035</b>                       | <b>518</b>                        | <b>2.07</b>                     | 2-3 hours           |
|            | US 6 to West 1st Access Point to I-70 | 50%                | 1035                      | 518                               | 259                               | 1.04                            |                     |
|            | US 6 to I-70 Exit 116                 | 50%                | 1035                      | 518                               | 259                               | 1.04                            |                     |

Table 16: Zones 7017-7021 Evacuation Information

| Scenario   | Route          | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|----------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | NB to Exit 114 | 100%               | 1210                      | 605                               | 303                               | 1.21                            | 1-2 hours           |

Table 17: Zones 7022-7029 Evacuation Information

| Scenario   | Route                 | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|-----------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | <b>NB Midland Ave</b> | <b>100%</b>        | <b>2480</b>               | <b>1240</b>                       | <b>620</b>                        | <b>2.48</b>                     | 2-3 hours           |
|            | WB to Exit 116        | 70%                | 1735                      | 868                               | 434                               | 1.74                            |                     |
|            | NB to Exit 114        | 30%                | 745                       | 373                               | 186                               | 0.75                            |                     |
| Scenario 2 | <b>NB Midland Ave</b> | <b>100%</b>        | <b>2480</b>               | <b>1240</b>                       | <b>620</b>                        | <b>2.48</b>                     | 2-3 hours           |
|            | WB to Exit 116        | 50%                | 1240                      | 620                               | 310                               | 1.24                            |                     |
|            | NB to Exit 114        | 50%                | 1240                      | 620                               | 310                               | 1.24                            |                     |

Table 18: Zones 7030-7044 Evacuation Information

| Scenario   | Route                | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|----------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | <b>WB SH 82</b>      | <b>100%</b>        | <b>7760</b>               | <b>3880</b>                       | <b>1940</b>                       | <b>3.88</b>                     | 3-4 hours           |
|            | WB SH 82 to Exit 116 | 70%                | 5430                      | 2715                              | 1358                              | 2.72                            |                     |
|            | WB SH 82 to Exit 114 | 30%                | 2330                      | 1165                              | 583                               | 2.33                            |                     |
| Scenario 2 | <b>WB SH 82</b>      | <b>100%</b>        | <b>7760</b>               | <b>3880</b>                       | <b>1940</b>                       | <b>3.88</b>                     | 3-4 hours           |
|            | WB SH 82 to Exit 116 | 50%                | 3880                      | 1940                              | 970                               | 1.94                            |                     |
|            | WB SH 82 to Exit 114 | 50%                | 3880                      | 1940                              | 970                               | 3.88                            |                     |

Table 19: Zones 7045-7048 Evacuation Information

| Scenario   | Route          | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|----------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | SB to SE SH 82 | 100%               | 6060                      | 3030                              | 1515                              | 3.03                            | 3 hours             |

Table 20: Zones 7049-7061 Evacuation Information

| Scenario   | Route                               | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|-------------------------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | <b>To I-70</b>                      | <b>100%</b>        | <b>1090</b>               | <b>545</b>                        | <b>273</b>                        | <b>1.09</b>                     | 1-2 hours           |
|            | To I-70 using Midland Ave > 27th St | 70%                | 765                       | 383                               | 191                               | 0.77                            |                     |
|            | To I-70 using Midland Ave > 8th St  | 30%                | 325                       | 163                               | 81                                | 0.33                            |                     |
| Scenario 2 | <b>To I-70</b>                      | <b>100%</b>        | <b>1090</b>               | <b>545</b>                        | <b>273</b>                        | <b>1.09</b>                     | 1-2 hours           |
|            | To I-70 using Midland Ave > 27th St | 50%                | 545                       | 273                               | 136                               | 0.55                            |                     |
|            | To I-70 using Midland Ave > 8th St  | 50%                | 545                       | 273                               | 136                               | 0.55                            |                     |

## APPENDIX B: ABBREVIATIONS AND ACRONYMS

AHJ - Authority Having Jurisdiction

CDOT - Colorado Department of Transportation

CMV - Commercial Motor Vehicle

COGS - City of Glenwood Springs

CSP - Colorado State Patrol

DTR - Digital Trunk Radio

EAS - Emergency Alert System

EMS - Emergency Medical Services

EOC - Emergency Operations Center

ES - Emergency Services

ETA - Estimated Time of Arrival

GCECA - Garfield County Emergency Communications Authority

GCR - Garfield County Road

GCSO - Garfield County Sheriff's Office

GSFD - Glenwood Springs Fire Department

GSPD - Glenwood Springs Police Department

GSPW - Glenwood Springs Public Works

IC - Incident Commander

ICP - Incident Command Post

ICS - Incident Command System

IGA - Intergovernmental Agreement

iNWS - Interactive National Weather Service

IPAWS - Integrated Public Alert & Warning System

JIC - Joint Information Center

MAC - Mutual Aid Channel

MOU - Memorandum of Understanding

NIMS - National Incident Management System

NWNET - Northwest Net

PCA - Personal Care Alternative

PIO - Public Information Officer

RFTA - Roaring Fork Transportation Authority

SH - State Highway

TIMP - Traffic Incident Management Plan

TMC - Traffic Management Center

UC - Unified Command

US - United States

VHF - Very High Frequency

VMS - Variable Message Sign

VVH - Valley View Hospital

## APPENDIX C: REFERENCES

Colorado Revised Statutes 2023; Title 24 - Government-State. Article 33.5 - Public Safety. Part 7 - Emergency Management; C.R.S. 24-33.5-709 Local disaster emergencies [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 30 - Government-County. Article 10 - County Officers. Part 5 - Sheriff 5; C.R.S. 30-10-512 Sheriff to act as fire warden [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 24 - Government-State. Article 33.5 - Public Safety. Part 7 - Emergency Management; C.R.S. 24-33.5-703 Definitions (3) & (3.5) [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 31 - Government-Municipal. Article 30 - Fire-Police. Part 1; C.R.S. 31-30-101 Authority to provide for classified departments. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 31 - Government-Municipal. Article 15 - Exercise of Municipal Powers. Part 4- Police Regulations; C.R.S. 31-15-401 General Police Powers. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 31 - Government-Municipal. Article 15 - Exercise of Municipal Powers. Part 6 - Building and Fire Regulations; C.R.S. 31-15-601 Building and Fire Regulations. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 32 - Special Districts. Article 1 - Special District Provisions. Part 10 - General Powers; C.R.S. 32-1-1002 (3)(a) Fire Protection Districts. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 24 - Government -State. Article 33.5 - Public Safety. Part 7 - Emergency Management; C.R.S. 24-33.5-701 Short Title. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 30 - Government-County. Article 10 - County Officers. Part 5 - Sheriff; C.R.S. 30-10-513 Duties of Sheriff. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 30 - Government-County. Article 10 - County Officers. Part 5 - Sheriff; C.R.S. 30-10-516 Sheriffs to Preserve Peace. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Colorado Revised Statutes 2023; Title 24 - Government-State. Article 33.5 - Public Safety. Part 7 - Emergency Management; C.R.S. 24-33.5-707 Local and Interjurisdictional Emergency Management Agencies and Services. [Colorado Legal Resources | Statutes Document Page \(lexis.com\)](#)

Glenwood City Ordinance 2023-12 - Disaster Emergency Services - an ordinance of the City of Glenwood Springs, Colorado, Amending Article 110.030 of the Glenwood Springs Municipal Code. [Colorado Cities by Population \(2023\) \(worldpopulationreview.com\)](#)

Garfield County Multi-Jurisdictional Hazard Mitigation Plan - 2022. Glenwood Springs Rural Fire Protection District Profile, Pages 1- 9. [hazard-mitigation-plan-glenwood-springs-fire-district-profile.pdf \(garfield-county.com\)](https://www.garfield-county.com/hazard-mitigation-plan-glenwood-springs-fire-district-profile.pdf)

National Incident Management System - Third Edition, October 2017. [National Incident Management System \(fema.gov\)](https://www.fema.gov/national-incident-management-system)

U.S. Department of Transportation-Federal Highway Administration, May 2017. Policy on Access to the Interstate System. [Policy on Access to the Interstate System - Interstate System - Design - Federal Highway Administration \(dot.gov\)](https://www.fhwa.dot.gov/policy/interstate_system_design/)

U.S. Department of Commerce - NOAA/NWS/NCEP, Weather Prediction Center. Winter Storm Severity Index (WSSI), 2023. [Winter Storm Severity Index Web Display \(noaa.gov\)](https://www.noaa.gov/winter-storm-severity-index-web-display)

U.S. Department of Homeland Security - Planning Considerations: Evacuation and Shelter-in-Place - Guidance for State, Local, Tribal, and Territorial Partners - July 2019.

FEMA - Developing and Maintaining Emergency Operations Plans - Comprehensive Preparedness Guide (CPG) 101 - September 2021, Version 3.0 [Developing and Maintaining Emergency Operations Plans Comprehensive Preparedness Guide \(fema.gov\)](https://www.fema.gov/developing-and-maintaining-emergency-operations-plans-comprehensive-preparedness-guide)

FEMA - Basic Emergency Operations Planning - Emergency Operations Basic Plan Template National Preparedness Directorate (NPD), September 2009.

Garfield County: Emergency Operations Plan - 2023 Volume I: Basic Plan

Garfield County Hazard Mitigation Plan - City of Glenwood Springs Community Profile - 2022.

Colorado Department of Transportation - Garfield County Traffic Incident Management Plan. October 2022. [Garfield County Traffic Incident Management Plan. 2022](https://www.colorado.gov/garfield-county-traffic-incident-management-plan-2022)

Glenwood Springs Fire Protection District - Community Wildfire Protection Plan - 2023 Update.

Glenwood Springs Transportation Update - February 2, 2023, Council Update.

Glenwood Springs Evacuation Planning - October 8, 2021.

Glenwood Springs Community Wildfire Protection Plan - October 2007.

Town of Breckenridge Emergency Operations Annex - Revised 2012.

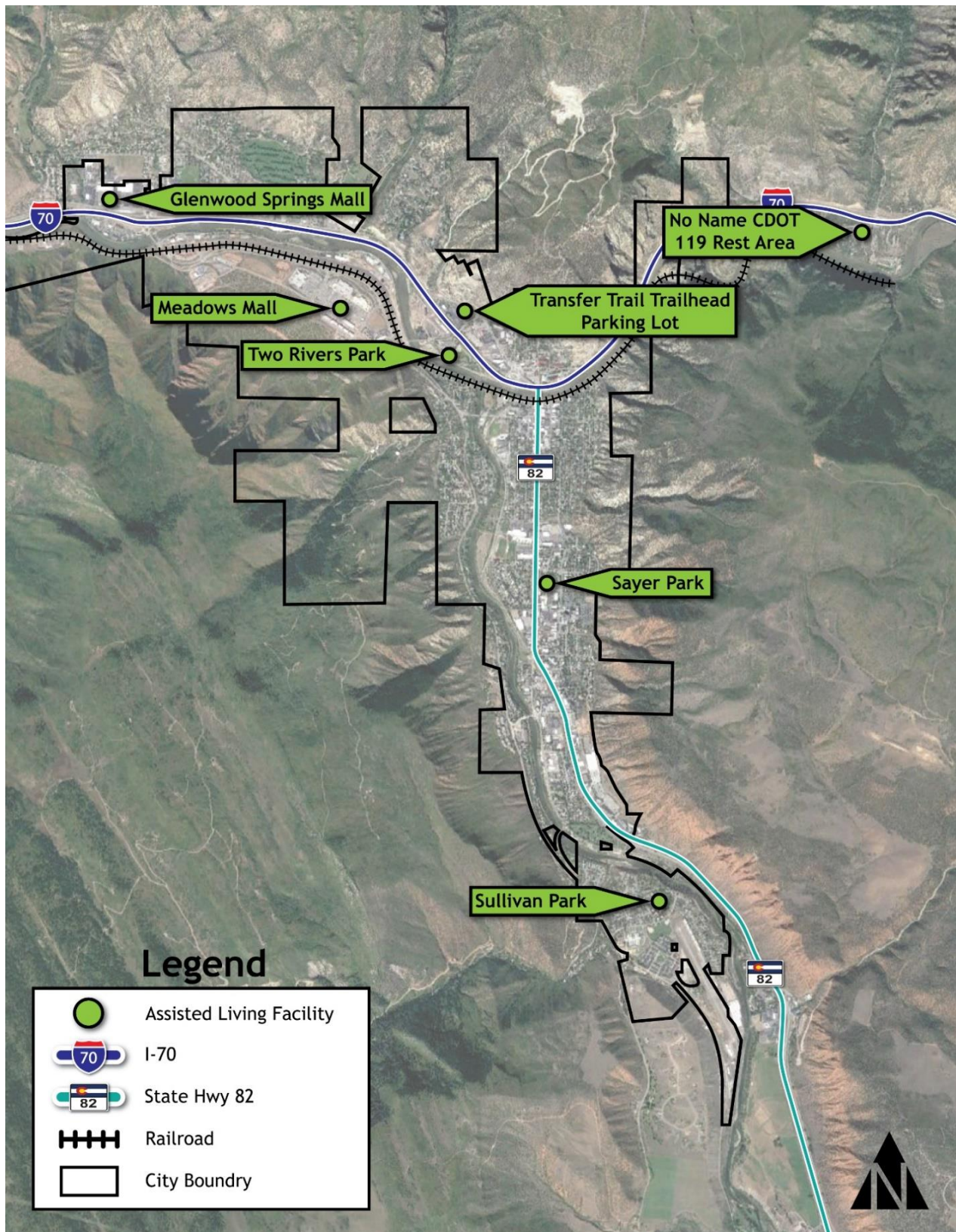
Eagle County Emergency Operations Plan - Evacuation Plan - May 2018.

Pikes Peak Regional Emergency Management - Evacuation Plan - November 2021.

Eagle County Emergency Operations Plan - Evacuation Plan - May 2018. EOP Annex G Town of Vail Emergency Evacuation Plan - August 2014



## APPENDIX D: VEHICLE STORAGE AREAS



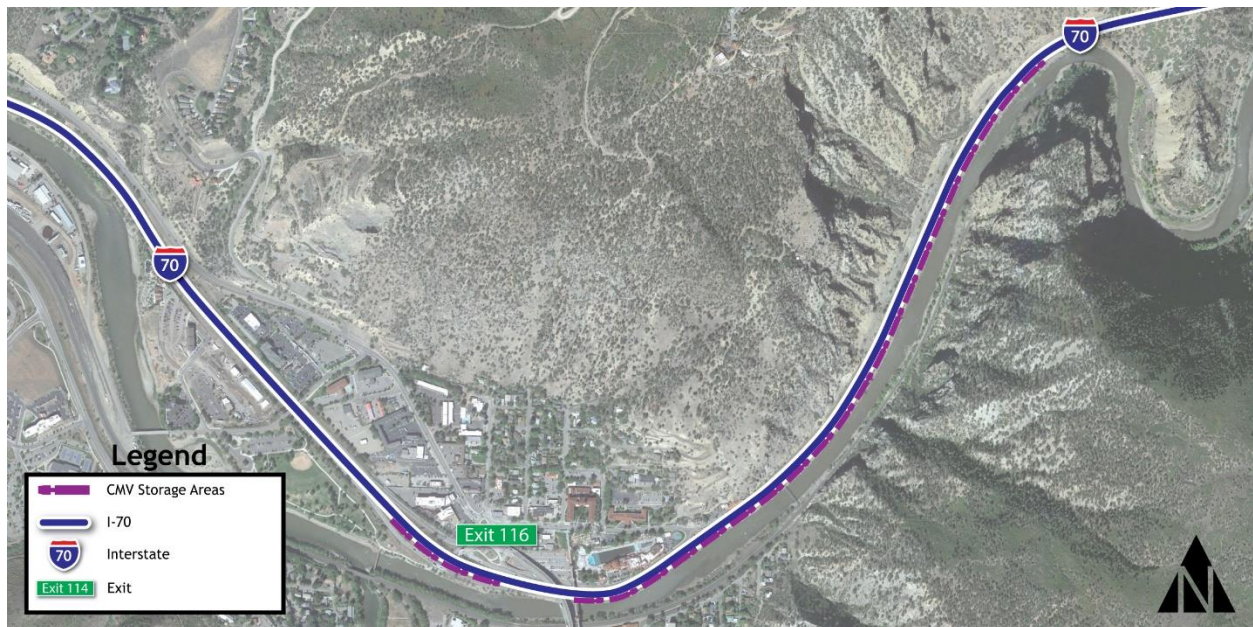
Passenger vehicle storage areas



## CMV Storage Areas



WB I-70 MP 114 & US 6 West Glenwood CMV Parking Areas



EB I-70 MP 116 CMV Parking Areas

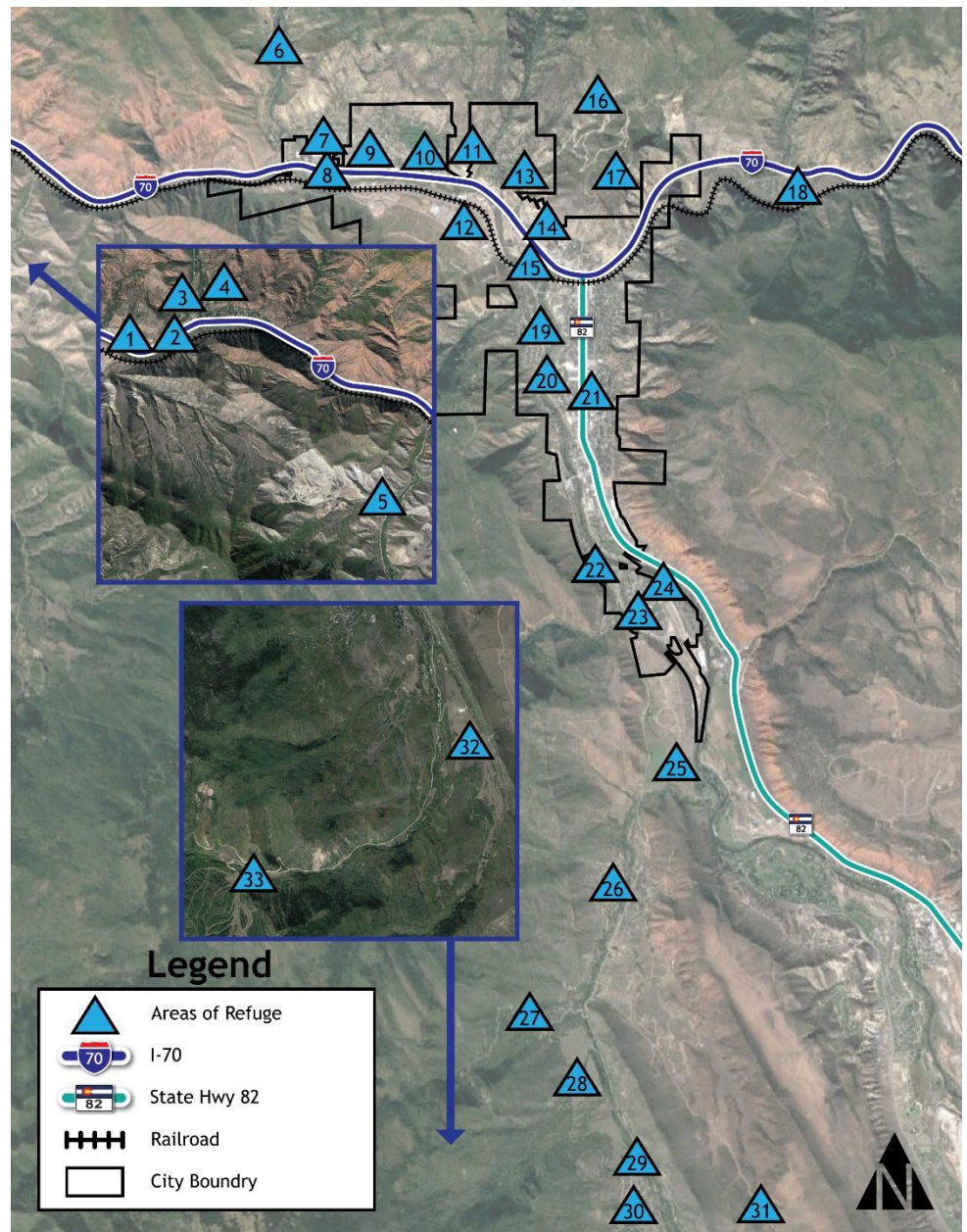


WB I-70 MP 119 No Name Rest Area CMV Parking Areas



**APPENDIX E: AREAS OF REFUGE / SAFE ZONES**

| #  | Areas of Refuge                      |
|----|--------------------------------------|
| 1  | New Creation Church                  |
| 2  | CPW Office                           |
| 3  | Orchard Creek Ranch                  |
| 4  | Canyon Creek Estates                 |
| 5  | South Canyon Landfill                |
| 6  | Upper Mitchell Creek Open Ranch Land |
| 7  | Diemoz Pasture                       |
| 8  | Glenwood Springs Mall                |
| 9  | GSMS Ball Fields                     |
| 10 | Glenwood Springs Golf Club           |
| 11 | Highlands Ranchland                  |
| 12 | Meadows Mall                         |
| 13 | Oasis Creek Park                     |
| 14 | Transfer Trail Parking               |
| 15 | Two Rivers Park                      |
| 16 | RMR Quarry                           |
| 17 | Glenwood Caverns Adventure Park      |
| 18 | No Name Rest Area                    |
| 19 | Veltus Park                          |
| 20 | Paraglider Landing Zone              |
| 21 | Sayre Park                           |
| 22 | Old Cardiff Bridge Rd                |
| 23 | Sopris Elementary School             |
| 24 | Sullivan Park                        |
| 25 | 4 Mile Ranch                         |
| 26 | Cheylyn Acres                        |
| 27 | Black Diamond Mine                   |
| 28 | Faranhyll Open Space                 |
| 29 | Oak Meadows RV Storage Area          |
| 30 | Oak Meadows Park & Tennis Court      |
| 31 | Dry Park Road                        |
| 32 | Bersheni Ranch                       |
| 33 | Sunlight Ski Area                    |

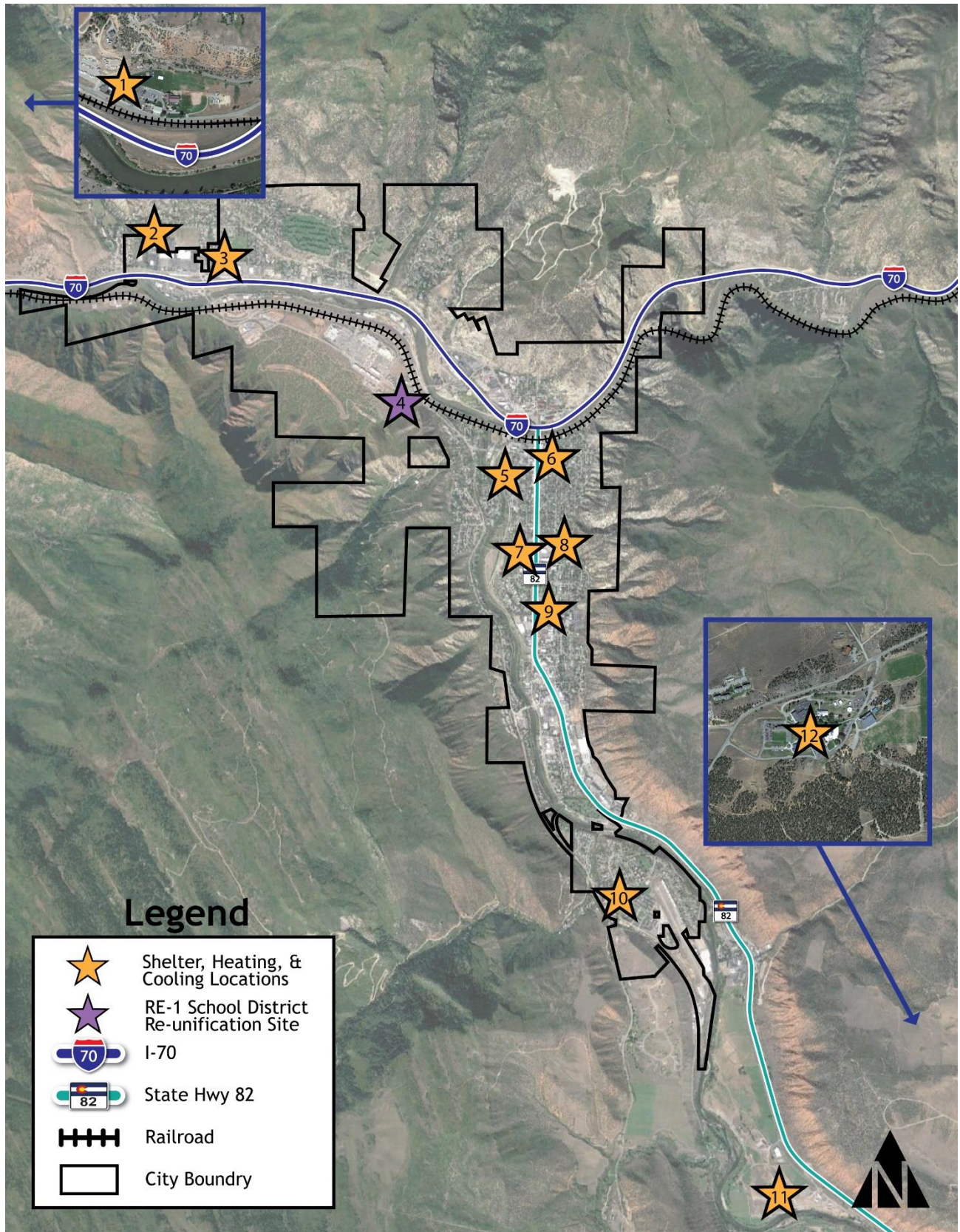


**APPENDIX F: SHELTERS / HEATING & COOLING CENTERS**

| # | Location                           | Emergency Shelter | Heating Cooling Center | Hours of Operation                                                        | Capacity                                                                                                            | Contact Name & Number |
|---|------------------------------------|-------------------|------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------|
| 1 | New Creation Church Campus         | Y                 | Y                      | Mon-Thurs 8am-4:30-pm<br>Preschool - Mon-Fri 8am-5:30pm                   | 300+                                                                                                                | [REDACTED]            |
| 2 | Two Rivers Community School        | Y                 | Y                      | Mon-Fri 7am-5pm;<br>excluding school holidays and summer breaks           | 400                                                                                                                 | [REDACTED]            |
| 3 | Glenwood Springs Middle School     | Y                 | Y                      | Mon-Fri 7am-5pm;<br>excluding school holidays and summer breaks           | 300-350                                                                                                             | [REDACTED]            |
| 4 | Glenwood Springs Community Center  | Y                 | Y                      | Mon-Thurs 6am - 8pm<br><br>Friday<br>6am - 6pm<br><br>Saturday 10am - 6pm | 600 - 850 in the CC lower level<br><br>150 - 250 in the CC upper level<br><br>800 -1000 at the ice rink<br>*80 cots | [REDACTED]            |
| 5 | Glenwood Springs Elementary School | Y                 | Y                      | Mon-Fri 7am-5pm;<br>excluding school holidays and summer breaks           | 300-350                                                                                                             | [REDACTED]            |
| 6 | Morgridge Commons                  | Y                 | Y                      | Mon-Fri 8am-5pm                                                           | 300 Max                                                                                                             | [REDACTED]            |
| 7 | Glenwood Springs High School       | Y                 | Y                      | Mon-Fri 7am-5pm;<br>excluding school holidays and summer breaks           | 300-350                                                                                                             | [REDACTED]            |
| 8 | CMC Glenwood Campus                | Y                 | Y                      | Mon-Thurs 8am-8:30pm<br>Friday 8am-5pm                                    | 60 Max in a large room: 300 Overall                                                                                 | [REDACTED]            |
| 9 | Saint Stephen Catholic School      | Y                 | Y                      | Mon-Fri 7am-5pm;<br>excluding school holidays and summer breaks           | 300                                                                                                                 | [REDACTED]            |

|    |                          |   |   |                                                                    |         |            |
|----|--------------------------|---|---|--------------------------------------------------------------------|---------|------------|
| 10 | Sopris Elementary School | Y | Y | Mon-Fri 7am-5pm;<br>excluding school holidays<br>and summer breaks | 300-350 | [REDACTED] |
| 11 | Riverview K8 School      | Y | Y | Mon-Fri 7am-5pm                                                    | 150     | [REDACTED] |
| 12 | CMC Spring Valley Campus | Y | Y | Mon-Fri 7am-5pm, Closed<br>in the summer                           | 1,000   | [REDACTED] |

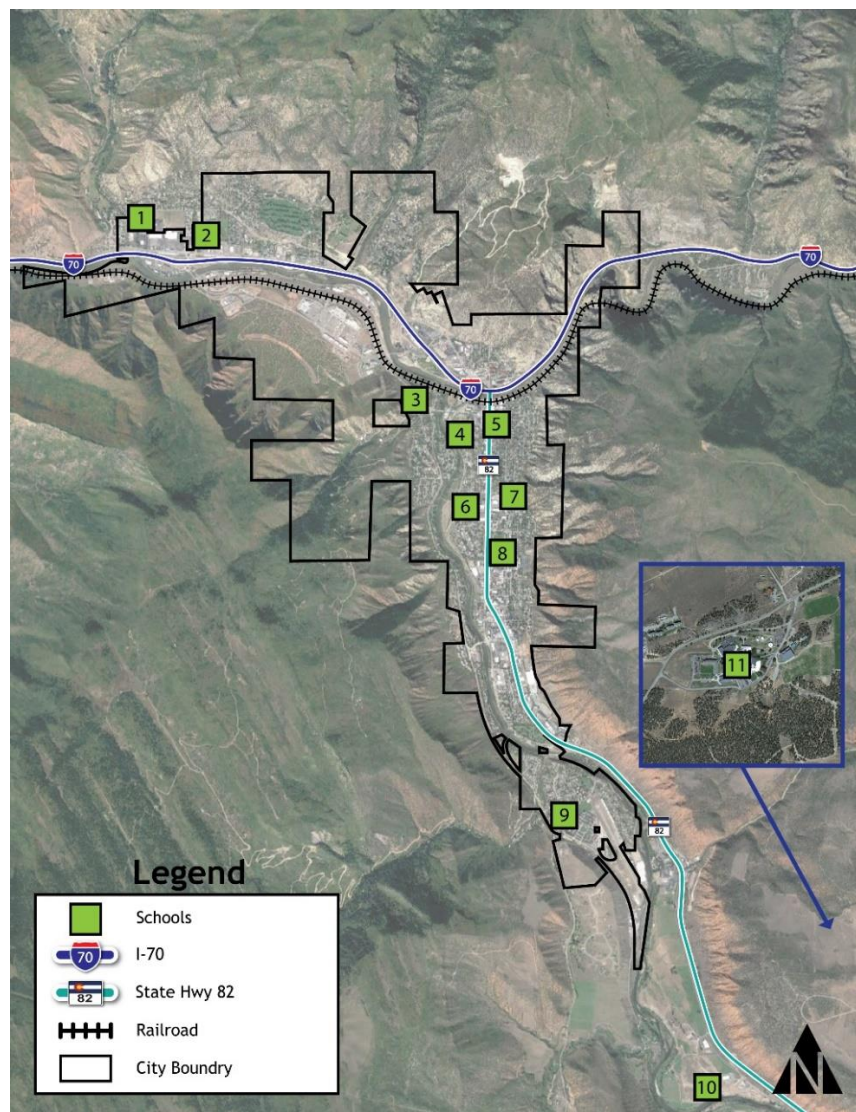




Shelters / Heating & Cooling Locations Map



| #  | School  | Everbridge Notifications (Y/N) | Shelter Facility (Y/N) | Heating /Cooling Center (Y/N) | Air Conditioning (Y/N) | Capacity Number | Available Parking Spaces | Evacuation Plan (Y/N) |
|----|---------|--------------------------------|------------------------|-------------------------------|------------------------|-----------------|--------------------------|-----------------------|
| 1  | TRCS    | N                              | Y                      | Y                             | Y                      | 400             | 36                       | Y                     |
| 2  | GSMS    | N                              | Y                      | Y                             | Y                      | 300-350         | 60                       | Y                     |
| 3  | YMS     | N                              | N                      | N                             | N                      | 100             | 30                       | Y                     |
| 4  | GSES    | N                              | Y                      | Y                             | Y                      | 300-350         | 150-200                  | Y                     |
| 5  | CMC-CC  | Y                              | Y                      | Y                             | Y                      | LIMITED         | 15                       | Y                     |
| 6  | GSHS    | N                              | Y                      | Y                             | Y                      | 300-350         | 60                       | Y                     |
| 7  | CMC-GCC | Y                              | Y                      | Y                             | Y                      | 100             | 60                       | Y                     |
| 8  | SSCC    | N                              | Y                      | Y                             | Y                      | 300             | 40                       | Y                     |
| 9  | SES     | N                              | Y                      | Y                             | Y                      | 300-350         | 60                       | Y                     |
| 10 | RK8     | N                              | Y                      | Y                             | Y                      | 300-350         | 60                       | Y                     |
| 11 | CMC-SVC | Y                              | Y                      | Y                             | Y                      | 1000            | 800                      | Y                     |



School Locations Map

## APPENDIX I: EVACUATION CHECK IN CHECK OUT PROCEDURES

Evacuation Center Check-in and Check-out operations will be conducted by the law enforcement agency having jurisdiction or their designee. Required check-in information will consist of the date checked in, evacuee's name, address evacuated from, number of people, contact phone number(s), special needs, and check-out date. Evacuees may be assigned to shelters based on the area of their residence.

| Check-in Date/Time | Contact Name | Address Evacuated from | Contact Phone Number | Special Needs/ Medication | Check out Date / Time | Destination |
|--------------------|--------------|------------------------|----------------------|---------------------------|-----------------------|-------------|
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |
|                    |              |                        |                      |                           |                       |             |

**APPENDIX J: AGENCY CONTACT LIST**

| Agency/Organization                                | Business Hours Phone Number | After Hours/Dispatch |
|----------------------------------------------------|-----------------------------|----------------------|
| Blue Sky Adventures                                | [REDACTED]                  |                      |
| Care Fight of the Rockies                          | [REDACTED]                  |                      |
| Classic Air Medical                                | [REDACTED]                  |                      |
| Colorado Department of Transportation - HLT        | [REDACTED]                  | [REDACTED]           |
| Colorado Mountain College (CMC)                    | [REDACTED]                  |                      |
| CMC - Glenwood Center Campus                       | [REDACTED]                  |                      |
| CMC - Spring Valley Campus                         | [REDACTED]                  |                      |
| CMC - Carbondale Campus                            | [REDACTED]                  |                      |
| Colorado Parks and Wildlife                        | [REDACTED]                  | [REDACTED]           |
| Colorado State Patrol                              | [REDACTED]                  | [REDACTED]           |
| Garfield County Emergency Communications Authority | [REDACTED]                  | [REDACTED]           |
| Garfield County Public Health                      | [REDACTED]                  |                      |
| Garfield County Road & Bridge                      | [REDACTED]                  |                      |
| Garfield County Sheriff's Office                   | [REDACTED]                  | [REDACTED]           |
| Glenwood Adventure Company                         | [REDACTED]                  |                      |
| Glenwood Chamber Resort Association                | [REDACTED]                  |                      |
| Glenwood Springs Adventure Park                    | [REDACTED]                  |                      |
| Glenwood Springs Community Center                  | [REDACTED]                  |                      |
| Glenwood Springs Fire Department                   | [REDACTED]                  | [REDACTED]           |
| Glenwood Springs Health Care                       | [REDACTED]                  |                      |
| Glenwood Springs Police Department                 | [REDACTED]                  | [REDACTED]           |
| Glenwood Springs Administration                    | [REDACTED]                  |                      |
| Glenwood Springs Public Works                      | [REDACTED]                  |                      |
| Glenwood Springs Park and Recreation               | [REDACTED]                  |                      |
| Glenwood Springs Public Information                | [REDACTED]                  |                      |
| Mountain Valley Developmental                      | [REDACTED]                  |                      |
| Montrose Regional Communication Center             | [REDACTED]                  | [REDACTED]           |
| New Creation Church                                | [REDACTED]                  |                      |
| Roaring Fork Assisted Living                       | [REDACTED]                  |                      |
| Roaring Fork RE-1 Schools                          | [REDACTED]                  |                      |
| RE-1 Glenwood Springs Elementary School            | [REDACTED]                  |                      |
| RE-1 Glenwood Springs Middle School                | [REDACTED]                  |                      |
| RE-1 Glenwood Springs High School                  | [REDACTED]                  |                      |
| RE-1 Sopris Elementary School                      | [REDACTED]                  |                      |
| RE-1 Riverview K8 School                           | [REDACTED]                  |                      |
| Roaring Fork Transportation Authority (RFTA)       | [REDACTED]                  | [REDACTED]           |
| St. Stephen Catholic School                        | [REDACTED]                  |                      |
| Sunnyside Assisted Living                          | [REDACTED]                  |                      |
| Two Rivers Community School                        | [REDACTED]                  |                      |
| Union Pacific                                      | [REDACTED]                  | [REDACTED]           |
| Valley View Hospital                               | [REDACTED]                  | [REDACTED]           |
| Yampa Mountain School                              | [REDACTED]                  |                      |

## APPENDIX L: STAKEHOLDER CONTACT LIST

| AGENCY                                | TITLE                             | NAME | EMAIL ADDRESS | PHONE |
|---------------------------------------|-----------------------------------|------|---------------|-------|
| Colorado Department of Transportation | Hanging Lake Tunnel - LTC Ops     |      |               |       |
| Colorado Department of Transportation | Statewide Emergency Manager       |      |               |       |
| Colorado Department of Transportation | Maintenance                       |      |               |       |
| Colorado Department of Transportation | Region 3 Access Manager           |      |               |       |
| Colorado Parks and Wildlife           | Officer                           |      |               |       |
| Colorado Mountain College             | Chief Operating Officer           |      |               |       |
| Colorado Mountain College             | Risk Management                   |      |               |       |
| Colorado State Patrol                 | Captain                           |      |               |       |
| Garfield County Communication Center  | Executive Director                |      |               |       |
| Garfield County Public Health         | MSN, RN                           |      |               |       |
| Garfield County Public Health         | Emergency Preparedness & Response |      |               |       |
| Garfield County Public Health         |                                   |      |               |       |
| Garfield County Sheriff's Office      | Sergeant                          |      |               |       |
| Garfield County Sheriff's Office      | Emergency Manager                 |      |               |       |
| Glenwood Chamber Resort Association   | Chief Executive Officer           |      |               |       |
| Glenwood Chamber Resort Association   | Director of Tourism               |      |               |       |
| Glenwood Springs Adventure Park       | General Manager                   |      |               |       |
| Glenwood Springs Community Center     | Manager                           |      |               |       |
| Glenwood Springs Fire Department      | Deputy Fire Chief                 |      |               |       |
| Glenwood Springs Fire Department      | Fire Chief                        |      |               |       |
| Glenwood Springs Health Care          | Regional Director                 |      |               |       |
| Glenwood Springs Health Care          |                                   |      |               |       |
| Glenwood Springs Police Department    | Lieutenant                        |      |               |       |

| AGENCY                                | TITLE                          | NAME | EMAIL ADDRESS | PHONE |
|---------------------------------------|--------------------------------|------|---------------|-------|
| Glenwood Springs Police Department    | Lieutenant                     |      |               |       |
| Glenwood Springs Police Department    | Chief                          |      |               |       |
| Glenwood Springs Police Department    | Sergeant                       |      |               |       |
| Glenwood Springs, City of             | Engineer                       |      |               |       |
| Glenwood Springs, City of             | City Manager                   |      |               |       |
| Glenwood Springs, City of             | Public Information Officer     |      |               |       |
| Glenwood Springs, City of             | Parks and Recreation Director  |      |               |       |
| Glenwood Springs, City of             | Public Works Director          |      |               |       |
| Mountain Valley Developmental         | Safety Coordinator             |      |               |       |
| New Creation Church                   | Pastor                         |      |               |       |
| New Creation Church                   | Associate                      |      |               |       |
| Roaring Fork Assisted Living          | Environmental Service Director |      |               |       |
| Roaring Fork Schools                  | Chief Operating Officer        |      |               |       |
| Roaring Fork Schools                  | Transportation Director        |      |               |       |
| Roaring Fork Transportation Authority | Safety Manager                 |      |               |       |
| Roaring Fork Transportation Authority | Director of Operations         |      |               |       |
| St. Stephen Catholic School           | Business Manager               |      |               |       |
| St. Stephen Catholic School           | Principal                      |      |               |       |
| Sunnyside Assisted Living             | Site Manager                   |      |               |       |
| Two Rivers Community School           |                                |      |               |       |
| Two Rivers Community School           |                                |      |               |       |
| Valley View Hospital                  | Chief Operating Officer        |      |               |       |
| Valley View Hospital                  | Trauma Manager                 |      |               |       |
| Yampa Mountain School                 | Principal                      |      |               |       |



## APPENDIX M: RECOMMENDATIONS AND OPPORTUNITIES

Resulting from the development of this plan recommendations are summarized as the following:

- Identify an Emergency Operations Center (EOC) location for the City of Glenwood Springs.
- Enhance local response capabilities through improved communications, equipment, and training.
- Continue to pursue a second bridge to access SH 82 which will help manage traffic from the southern end of the city to help serve communities on 4-Mile Road, 3-Mile Road, and South Glenwood Springs.
- Conduct community outreach activities to raise awareness of evacuation and sheltering actions for individuals and the community.
- Work to expand the City of Glenwood Springs' agreement with RFTA (Ride Glenwood) to include the use of RFTA buses in an emergency situation or establish an MOU/IGA.
- Research the use of Salamander as a credentialing system.
- Identify additional locations for Public Works to store key traffic control devices (cones, barrels, barricades) for quick access to critical traffic control locations.
- Explore funding for additional DTR portable radios to be deployed on an as-needed basis or convert Public Works over to the DTR System.
- Develop a community poster to display in public buildings (post office) referencing alternate routes, evacuation routes, Everbridge sign-up information, and general safety information about this plan and the Garfield TIMP.
- Explore a digital sign-up for the Everbridge Emergency Notification System.
- Research and identify cell phone coverage gaps on 4-Mile Road.
- Disseminate Everbridge Emergency Notification System cards to area businesses.
- Review the special event application process to include a safety/medical plan for event coordinators.
- Conduct a special meeting with the Glenwood Chamber Resort Association to enhance community and business information sharing.
- Critical infrastructures that are critical for traffic management should be further investigated to provide better traffic flow, i.e., 27<sup>th</sup> Street roundabouts.
- After action review (AAR) triggers should be discussed and documented by agency leads to create a culture of continuous improvement.



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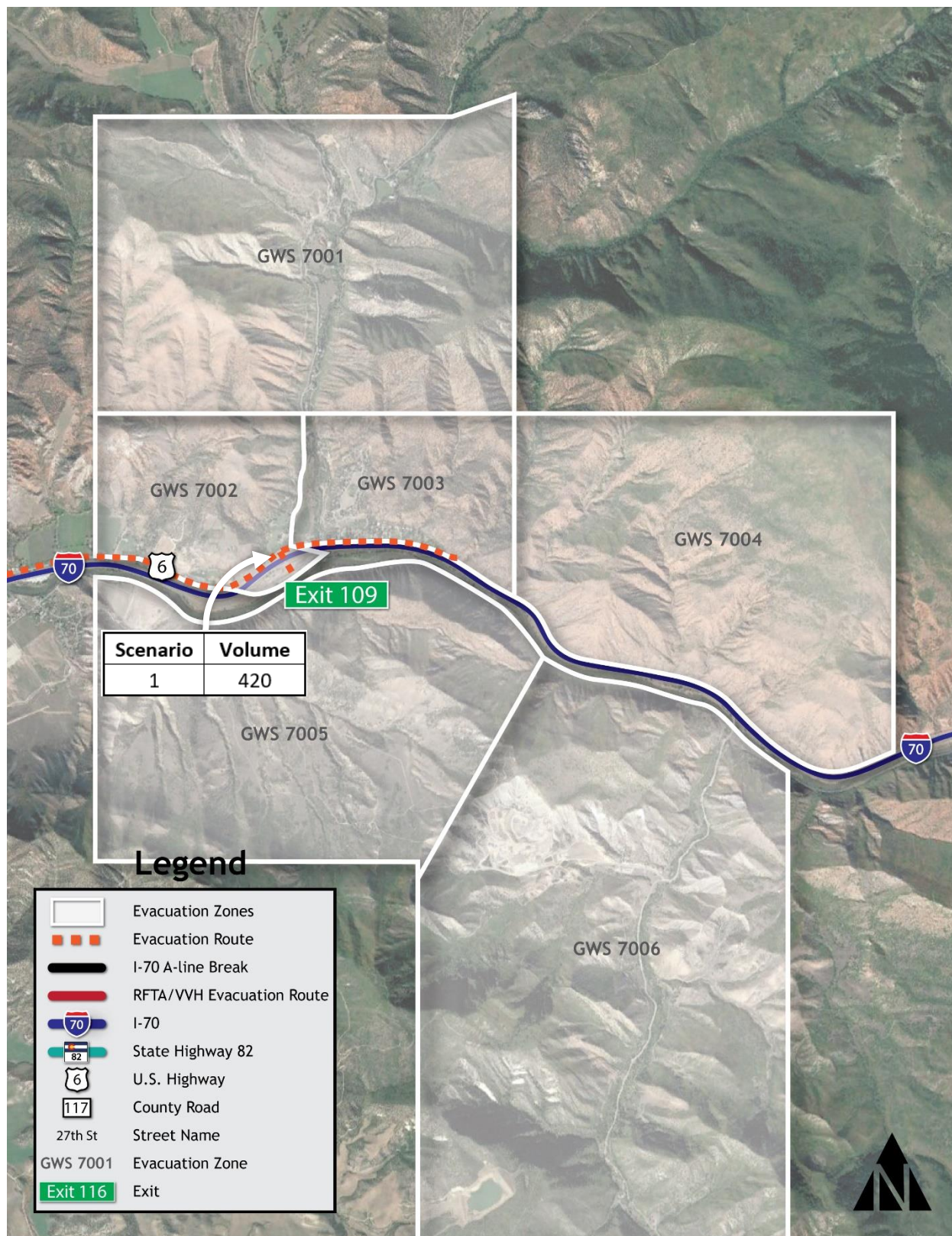
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# GLENWOOD SPRINGS EVACUATION GUIDE



|                                                                   |                                                                                                                                                                                                                          |                                  |                                                                                                                                      |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                                 | Canyon Creek/South Canyon<br>5 Zones                                                                                                                                                                                     | Zones                            | Zones GWS 7001-7006                                                                                                                  |
| City                                                              | N/A                                                                                                                                                                                                                      | County                           | Garfield                                                                                                                             |
| Communities                                                       | -Upper Canyon Creek<br>-Lower Canyon Creek<br>-Canyon Creek Estates<br>-Colorado Parks and Wildlife                                                                                                                      | Areas of<br>Refuge/Safe<br>Zones | -New Creation Church<br>-Colorado Parks and Wildlife<br>Office<br>-Orchard Creek Ranch<br>-Canyon Creek Estates<br>Neighborhood Park |
| Law Enforcement                                                   | Garfield County SO,<br>Colorado State Patrol,<br>Colorado Parks and Wildlife                                                                                                                                             | Fire Protection<br>District      | Glenwood Springs FD                                                                                                                  |
| Evacuation Routes -<br>other routes may be<br>developed if needed | <b>Primary:</b><br>WB US 6 > I-70<br><b>Alternate:</b><br>WB US 6 towards New Castle                                                                                                                                     |                                  |                                                                                                                                      |
| Critical Facilities                                               | -Colorado Parks and Wildlife<br>-South Canyon Municipal Landfill                                                                                                                                                         |                                  |                                                                                                                                      |
| Critical Intersections<br>to Control                              | -Canyon Creek Drive @ US 6<br>-I-70 @ Exit 109 (Canyon Creek)                                                                                                                                                            |                                  |                                                                                                                                      |
| Special<br>Considerations for<br>this Zone                        | It may be necessary to close I-70 or reduce to one lane at the on-ramps of Exit 109 (Canyon Creek). Westbound US 6 to New Castle is an additional option for egress traffic.                                             |                                  |                                                                                                                                      |
| Estimated Number<br>of Vehicles to<br>Evacuate (2030)             | 420                                                                                                                                                                                                                      |                                  |                                                                                                                                      |
| Estimated<br>Population (2030)                                    | Unknown                                                                                                                                                                                                                  |                                  |                                                                                                                                      |
| Evacuation Scenarios                                              | Scenario 1<br><ul style="list-style-type: none"> <li>100% of traffic is led on US 6 to I-70 On-Ramp at Exit 109.</li> </ul> *If traffic exceeds capacity on this roadway, vehicles can be sent WB on US 6 to New Castle. |                                  |                                                                                                                                      |

# GLENWOOD SPRINGS EVACUATION GUIDE



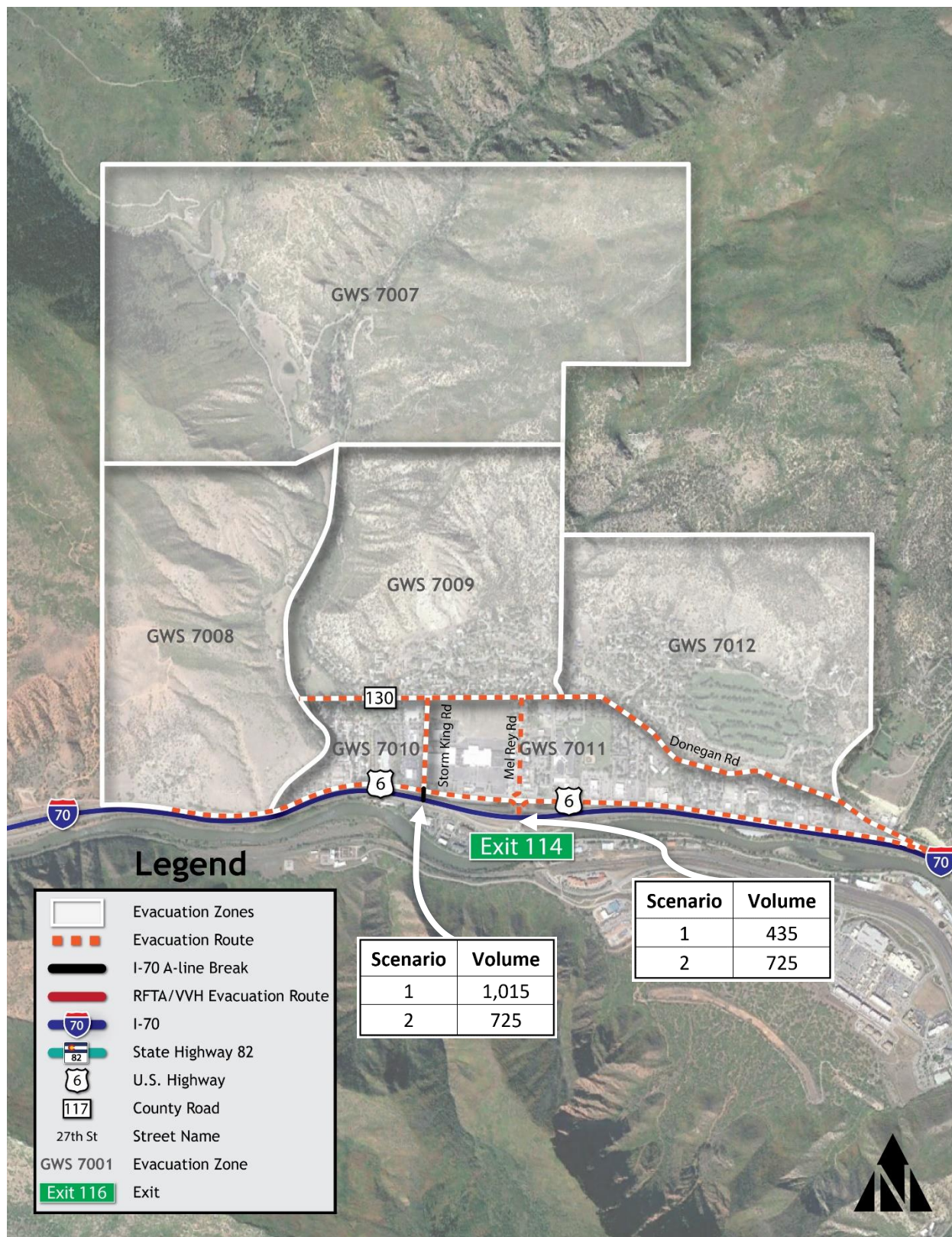


# GLENWOOD SPRINGS EVACUATION GUIDE



|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                            |                                                                                                                                        |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                           | Mitchell Creek/West Glenwood Springs<br>6 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Zones                      | Zones GWS 7007-7012                                                                                                                    |
| City                                                        | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | County                     | Garfield                                                                                                                               |
| Communities                                                 | -Mitchell Creek<br>-Ami’s Acres<br>-West Glenwood North of I-70 & to East to Sunny Acres Rd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Areas of Refuge/Safe Zones | -Upper Mitchell Creek Open Ranch Land<br>-Diemoz Pasture<br>-Glenwood Springs Mall<br>-GSMS Ball Fields<br>-Glenwood Springs Golf Club |
| Law Enforcement                                             | Garfield County SO, Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Fire Protection District   | Glenwood Springs FD                                                                                                                    |
| Evacuation Routes - other routes may be developed if needed | <b>Primary:</b><br>Donegan Rd > Storm King Rd Access Pt. > I-70<br><b>Alternate:</b><br>Donegan Rd > Mel Ray Rd > US 6 roundabout > I-70<br><b>Alternate:</b><br>Donegan Rd > US 6 > West 1 <sup>st</sup> Access Pt. > I-70                                                                                                                                                                                                                                                                                                                                                              |                            |                                                                                                                                        |
| Critical Facilities                                         | -Two Rivers School<br>-Glenwood Springs Fire Station #1<br>-Glenwood Springs Middle School                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                                                                                                                                        |
| Critical Intersections to Control                           | -Storm King Rd @ US 6<br>-Mel Ray Rd/US 6 Roundabout<br>-Donegan Rd @ US 6<br>-Storm King Rd Access Point @ I-70<br>-West 6 <sup>th</sup> St @ West 1 <sup>st</sup> St<br>-West 1 <sup>st</sup> St Access Point @ I-70                                                                                                                                                                                                                                                                                                                                                                   |                            |                                                                                                                                        |
| Special Considerations for this Zone                        | Follow access line break procedure. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County), and SH 82 at CR 154 (MP 5). Evacuate by evacuation zones based on the direction of the hazard/threat. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes.                                                                                                                                                                                                        |                            |                                                                                                                                        |
| Estimated Number of Vehicles to Evacuate (2030)             | 1,450                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                                                                                                                        |
| Estimated Population (2030)                                 | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |                                                                                                                                        |
| Evacuation Scenarios                                        | Scenario 1 <ul style="list-style-type: none"><li>70% of traffic is led on Donegan Rd to Storm King Rd Access Point to I-70.</li><li>30% of traffic is led on Donegan Rd to Mel Ray Rd to I-70 On-Ramp at Exit 114.</li></ul> Scenario 2 <ul style="list-style-type: none"><li>50% of traffic is led on Donegan Rd to Storm King Rd Access Point to I-70.</li><li>50% of traffic is led on Donegan Rd to Mel Ray Rd to I-70 On-Ramp at Exit 114.</li></ul> *If traffic exceeds capacity on these roadways’, vehicles can be sent SB on US 6 to West 1 <sup>st</sup> Access Point to I-70. |                            |                                                                                                                                        |

# GLENWOOD SPRINGS EVACUATION GUIDE



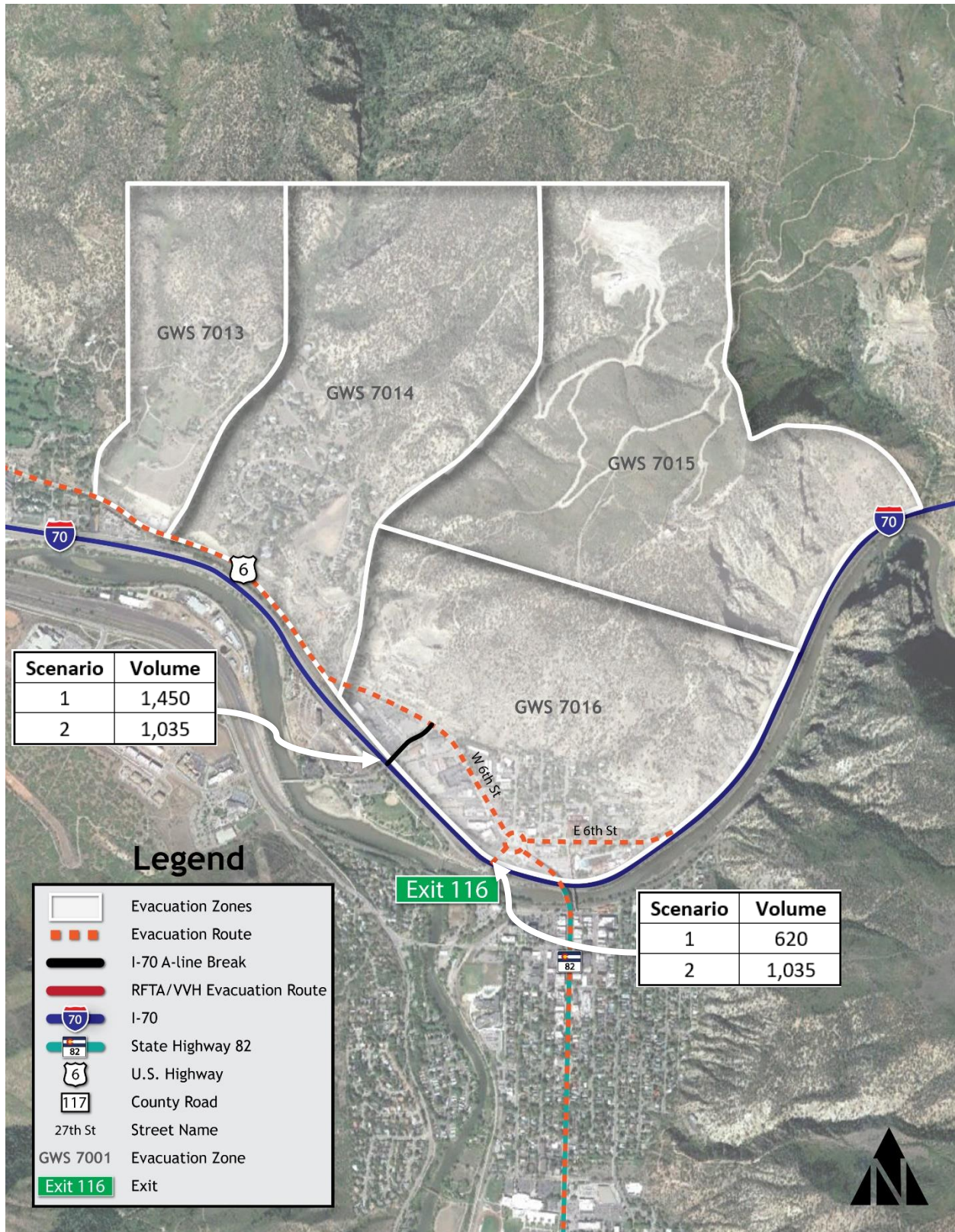


# GLENWOOD SPRINGS EVACUATION GUIDE



|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                            |                                                                                                                             |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                           | Highlands/Oasis Creek/6 <sup>th</sup> St Area<br>4 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Zones                      | Zones GWS 7013-7016                                                                                                         |
| City                                                        | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | County                     | Garfield                                                                                                                    |
| Communities                                                 | -Highlands<br>-Oasis Creek<br>-Glenwood Caverns Adventure Park                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Areas of Refuge/Safe Zones | -Highlands Ranchland<br>-Oasis Creek Park<br>-Transfer Trail Parking Lot<br>-RMR Quarry<br>-Glenwood Caverns Adventure Park |
| Law Enforcement                                             | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Fire Protection District   | Glenwood Springs FD                                                                                                         |
| Evacuation Routes - other routes may be developed if needed | <b>Primary:</b><br>US 6 > West 1 <sup>st</sup> Access Point > I-70<br><b>Alternate:</b><br>US 6 > I-70 (Exit 116)<br><b>Alternate:</b><br>US 6 > Grand Ave > SH 82 South/East                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                                                                                                                             |
| Critical Facilities                                         | -Glenwood Center for the Arts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                            |                                                                                                                             |
| Critical Intersections to Control                           | -Donegan Rd @ US 6<br>-West 6 <sup>th</sup> St @ West 1 <sup>st</sup> St<br>-West 1 <sup>st</sup> St Access Point @ I-70<br>-6 <sup>th</sup> St @ I-70 Roundabout<br>-Grand Ave @ 6 <sup>th</sup> St Traffic Light                                                                                                                                                                                                                                                                                                                                                                         |                            |                                                                                                                             |
| Special Considerations for this Zone                        | Follow access line break process. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5). Evacuate by evacuation zones based on the direction of hazard/threat. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes.                                                                                                                                                                                                                 |                            |                                                                                                                             |
| Estimated Number of Vehicles to Evacuate (2030)             | 2,070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                            |                                                                                                                             |
| Estimated Population (2030)                                 | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                                                                                                             |
| Evacuation Scenarios                                        | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led SB on Donegan Rd &amp; US 6 to West 1<sup>st</sup> Access Point to I-70.</li> <li>30% of traffic is led SB on Donegan Rd &amp; US 6 to I-70 On-Ramp at Exit 116.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>50% of traffic is led SB on Donegan Rd &amp; US 6 to West 1<sup>st</sup> Access Point to I-70.</li> <li>50% of traffic is led SB on Donegan Rd &amp; US 6 to I-70 On-Ramp at Exit 116.</li> </ul> *If traffic exceeds capacity on these roadways', vehicles can be sent SB on SH 82. |                            |                                                                                                                             |

# GLENWOOD SPRINGS EVACUATION GUIDE



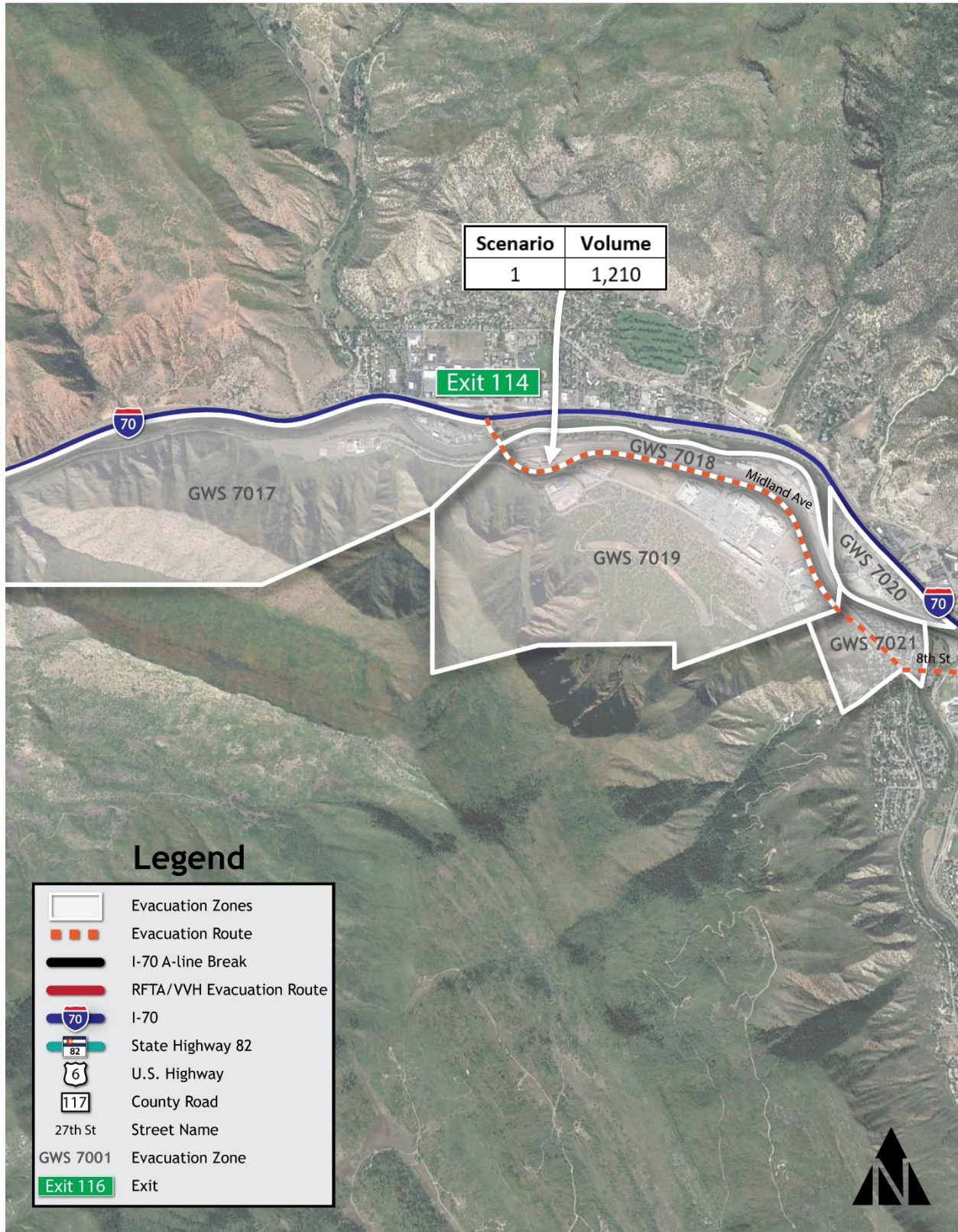
# GLENWOOD SPRINGS EVACUATION GUIDE



|                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  |                                   |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------|
| Zone Name & Count                                                 | Glenwood Meadows<br>5 Zones                                                                                                                                                                                                                                                                                                                                                                                                           | Zones                            | Zones GWS 7017-7021               |
| City                                                              | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                      | County                           | Garfield                          |
| Communities                                                       | -Glenwood Meadows<br>-Devereux Business<br>-Two Rivers Park                                                                                                                                                                                                                                                                                                                                                                           | Areas of<br>Refuge/Safe<br>Zones | -Meadows Mall<br>-Two Rivers Park |
| Law Enforcement                                                   | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                   | Fire Protection<br>District      | Glenwood Springs FD               |
| Evacuation Routes -<br>other routes may be<br>developed if needed | <b>Primary:</b><br>Midland Ave > I-70 (Exit 114)<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > I-70 (Exit 116)<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > SH 82 South/East                                                                                                                                                                                                       |                                  |                                   |
| Critical Facilities                                               | -Glenwood Springs Water Treatment Plant<br>-Glenwood Springs Wastewater Treatment Plant<br>-City Fleet Maintenance<br>-Roaring Fork Transportation Authority<br>-Electrical Operations Center<br>-Natural Grocers<br>-CSP/CDOT Complex<br>-Glenwood Springs Community Center<br>-Yampa Mountain High School                                                                                                                           |                                  |                                   |
| Critical Intersections<br>to Control                              | -Midland/I-70 Roundabout<br>-Midland Ave @ 8 <sup>th</sup> St<br>-8 <sup>th</sup> St @ Grand Ave<br>-6 <sup>th</sup> St @ I-70 Roundabout<br>-Grand Ave @ 6 <sup>th</sup> St Traffic Light                                                                                                                                                                                                                                            |                                  |                                   |
| Special<br>Considerations for<br>this Zone                        | Trails behind Glenwood Meadows may have cyclists or pedestrians. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes. Traffic control may be needed to access I-70 at Exit 114 (West Glenwood) and Exit 116 (Glenwood). It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5). |                                  |                                   |
| Estimated Number<br>of Vehicles to<br>Evacuate (2030)             | 1,210                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |                                   |
| Estimated<br>Population (2030)                                    | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |                                   |
| Evacuation Scenarios                                              | Scenario 1 <ul style="list-style-type: none"> <li>100% of traffic is led NB on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> *If traffic exceeds capacity on this roadway, vehicles can be sent SB on Midland Ave, EB on 8 <sup>th</sup> St, then either SB on SH 82 or NB on SH 82 to I-70 Exit 116.                                                                                                                           |                                  |                                   |



# GLENWOOD SPRINGS EVACUATION GUIDE



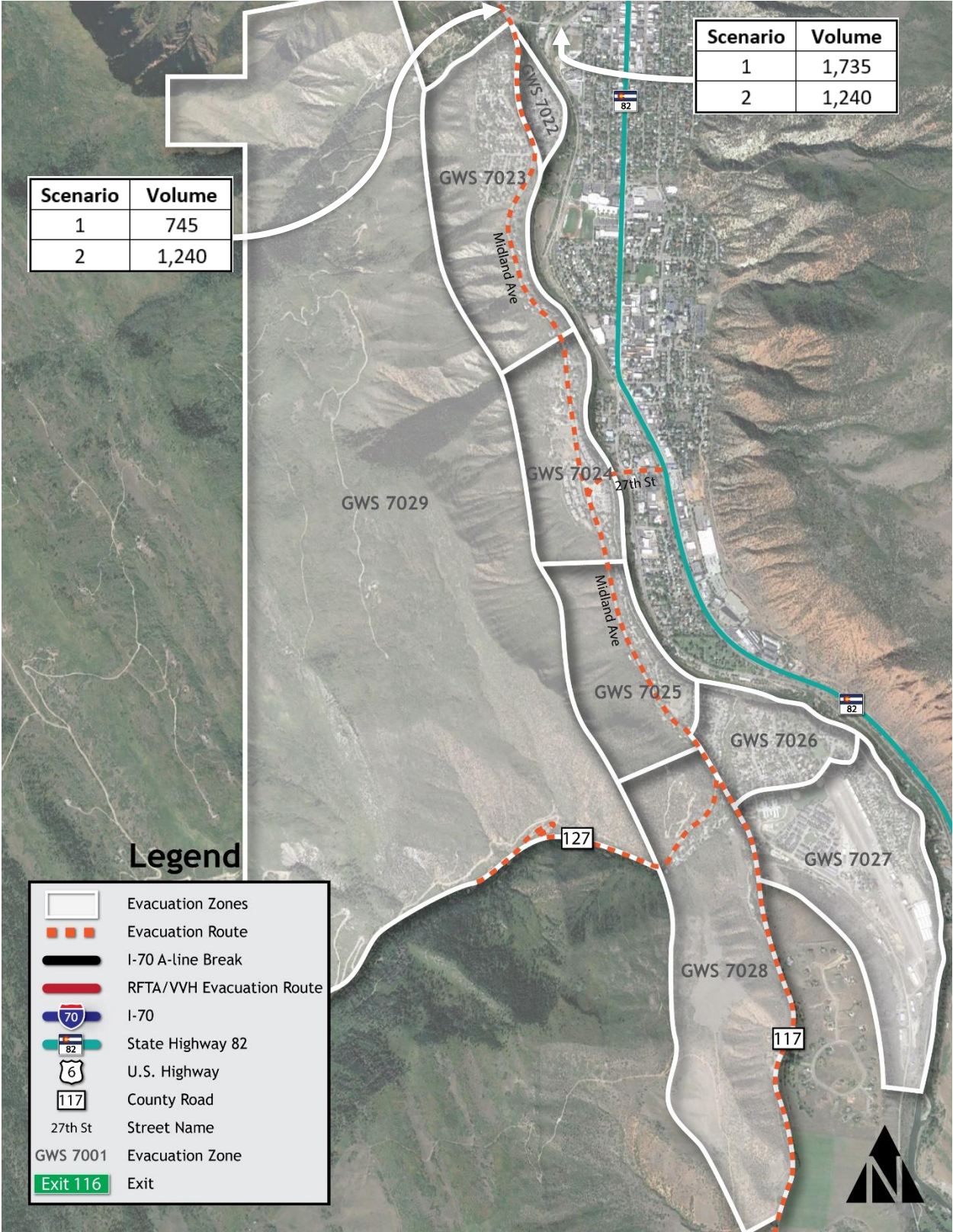
# GLENWOOD SPRINGS EVACUATION GUIDE



|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |                                                                                                                   |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                                    | Midland Avenue Corridor<br>8 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Zones                            | Zones GWS 7022-7029                                                                                               |
| City                                                                 | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | County                           | Garfield                                                                                                          |
| Communities                                                          | -Midland Ave.<br>-3-Mile<br>-Cardiff                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Areas of<br>Refuge/Safe<br>Zones | -Veltus Park<br>-Old Cardiff Bridge Rd<br>-Sopris Elementary School<br>-Sullivan Park<br>-Paraglider Landing Zone |
| Law Enforcement                                                      | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Fire Protection<br>District      | Glenwood Springs FD                                                                                               |
| Evacuation Routes -<br>other routes may<br>be developed if<br>needed | <b>Primary:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > I-70 (Exit 116)<br><b>Alternate:</b><br>Midland Ave > 27 <sup>th</sup> St > South Glen Ave > SH 82/I-70 (Exit 116)<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > I-70 (Exit 114)                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |                                                                                                                   |
| Critical Facilities                                                  | -Red Mountain Water Treatment Plant<br>-Sopris Elementary School<br>-Glenwood Springs Municipal Airport<br>-Black Hills Energy<br>-Street/SWAT Facility<br>-Holy Cross Energy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                                                                                                                   |
| Critical<br>Intersections to<br>Control                              | -Grand Ave @ 6 <sup>th</sup> St Traffic Light<br>-6 <sup>th</sup> St @ I-70 Roundabout<br>-Midland Ave @ 27 <sup>th</sup> St Roundabout<br>-27 <sup>th</sup> St Roundabout @ South Grand Ave<br>-27 <sup>th</sup> St @ South Glen Ave                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |                                                                                                                   |
| Special<br>Considerations for<br>this Zone                           | Red Mountain trails may have cyclists or pedestrians. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes. The 27 <sup>th</sup> Street roundabouts need to be monitored by traffic control personnel. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5).                                                                                                                                                                                                                                                                              |                                  |                                                                                                                   |
| Estimated Number<br>of Vehicles to<br>Evacuate (2030)                | 2,480                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |                                                                                                                   |
| Estimated<br>Population (2030)                                       | 3,200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |                                                                                                                   |
| Evacuation<br>Scenarios                                              | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>50% of traffic is led NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>50% of traffic is led NB on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> *If traffic exceeds capacity on these roadways', vehicles can be sent SB on Midland Ave, EB on 27 <sup>th</sup> St, then either SB on SH 82 or NB on SH 82 to I-70 Exit 116. |                                  |                                                                                                                   |



# GLENWOOD SPRINGS EVACUATION GUIDE



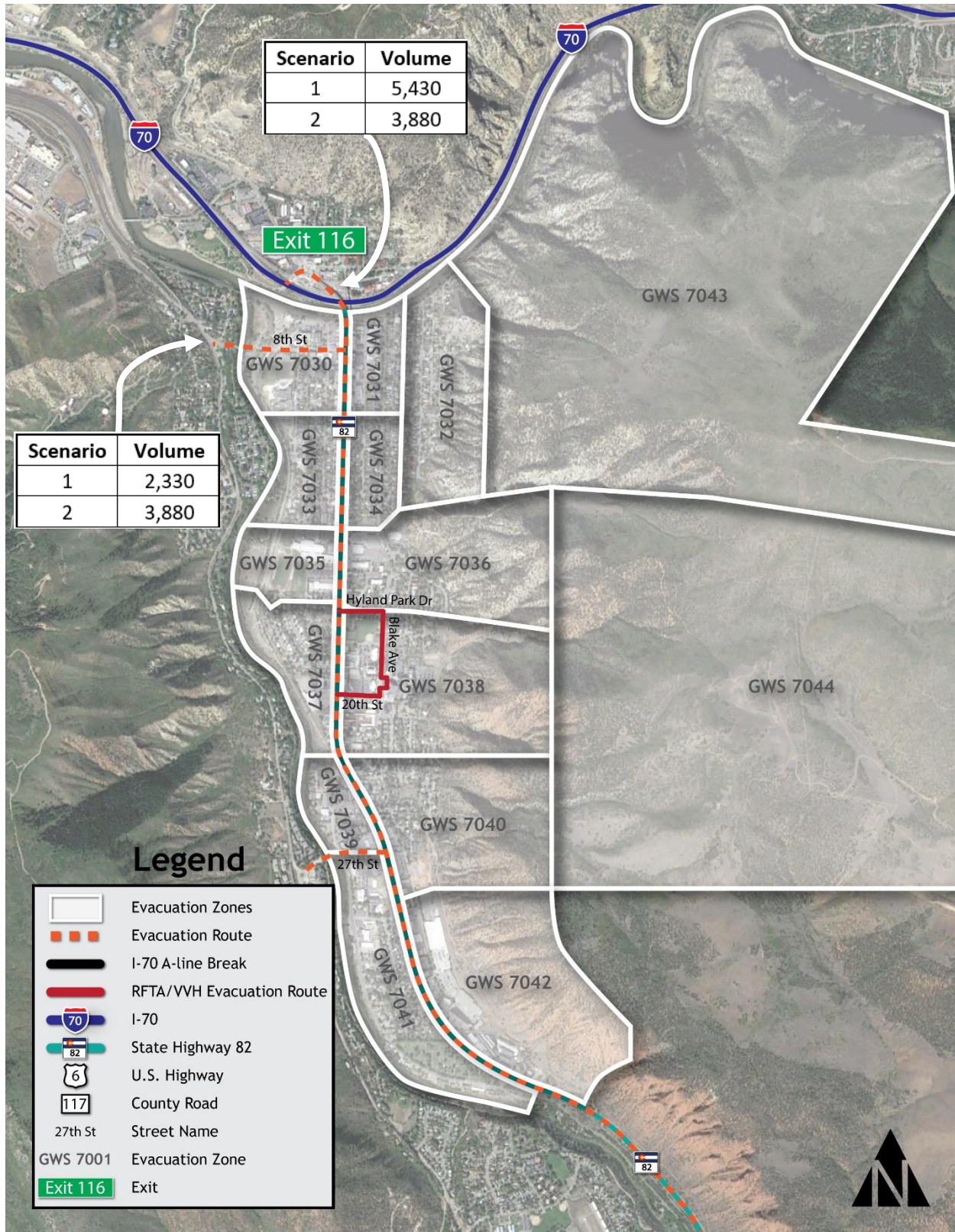


# GLENWOOD SPRINGS EVACUATION GUIDE



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|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------|
| Zone Name & Count                                                    | Downtown/South GWS<br>15 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Zones                         | Zones GWS 7030-7044                     |
| City                                                                 | Glenwood Springs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | County                        | Garfield                                |
| Communities                                                          | -Downtown<br>-South GWS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Areas of<br>Refuge/Safe Zones | -Sayre Park<br>-Paraglider Landing Zone |
| Law Enforcement                                                      | Glenwood Springs PD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Fire Protection<br>District   | Glenwood Springs FD                     |
| Evacuation Routes -<br>other routes may<br>be developed if<br>needed | <b>Primary:</b><br>Grand Ave > 6 <sup>th</sup> St > I-70 (Exit 116)<br><b>Alternate:</b><br>Grand Ave > 8 <sup>th</sup> St > Midland Ave > I-70 (Exit 114)<br><b>Alternate:</b><br>Grand Ave > SH 82 South/East                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                               |                                         |
| Critical Facilities                                                  | <div>           -GWS Elementary School<br/>           -GWS Police Department<br/>           -GWS City Hall<br/>           -Garfield County Sheriff's Office &amp; Jail<br/>           -Garfield County Courthouse<br/>           -Garfield County Admin. Annex<br/>           -Garfield Administration Building<br/>           -Garfield County Human Resources<br/>           -GWS Post Office<br/>           -CMC Administration         </div> <div>           -GWS Branch Library<br/>           -GWS Fire Station #2<br/>           -GWS Amtrak Station<br/>           -US Forest Service<br/>           -GWS Recycle Center<br/>           -GWS High School<br/>           -Grocery Store<br/>           -CMC Glenwood Center<br/>           -Saint Stephens Catholic School and Parish Center<br/>           -Valley View Hospital         </div> |                               |                                         |
| Critical<br>Intersections to<br>Control                              | <div>           -8<sup>th</sup> St @ Grand Ave<br/>           -Grand Ave @ 6<sup>th</sup> St Traffic Light<br/>           -6<sup>th</sup> St @ I-70 Roundabout         </div> <div>           -Midland Ave @ 8<sup>th</sup> St<br/>           -Midland/I-70 Roundabout<br/>           -27<sup>th</sup> St @ South Glen Ave         </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |                                         |
| Special<br>Considerations for<br>this Zone                           | <p>Critical facilities is high in this area. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes to both I-70 and south on SH 82 towards Carbondale. Doc Holiday Trail may have pedestrians, check trailhead. Evacuate by evacuation zones based on the direction of hazard/threat. It may be necessary to close I-70 EB at Exit 109 (Canyon Creek) and WB at Exit 119 (No Name), Exit 133 (Dotsero in Eagle County) and SH 82 at CR 154 (MP 5).</p>                                                                                                                                                                                                                                                                                                                                                    |                               |                                         |
| Estimated Number<br>of Vehicles to<br>Evacuate (2030)                | 7,760                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |                                         |
| Estimated<br>Population (2030)                                       | 4,500<br>*The population is much lower than the expected number of vehicles to evacuate due to the large amount of infrastructure and the hotels/tourist attractions in this area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                               |                                         |
| Evacuation<br>Scenarios                                              | <p>Scenario 1</p> <ul style="list-style-type: none"> <li>70% of traffic is led NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on SH 82, WB on 8<sup>th</sup> St, and NW on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> <p>Scenario 2</p> <ul style="list-style-type: none"> <li>50% of traffic is led NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>50% of traffic is led NB on SH 82, WB on 8<sup>th</sup> St, and NW on Midland Ave to I-70 On-Ramp at Exit 114.</li> </ul> <p>*If traffic exceeds capacity on these roadways', vehicles can be sent SB on SH 82.</p>                                                                                                                                                                                                                                          |                               |                                         |

# GLENWOOD SPRINGS EVACUATION GUIDE



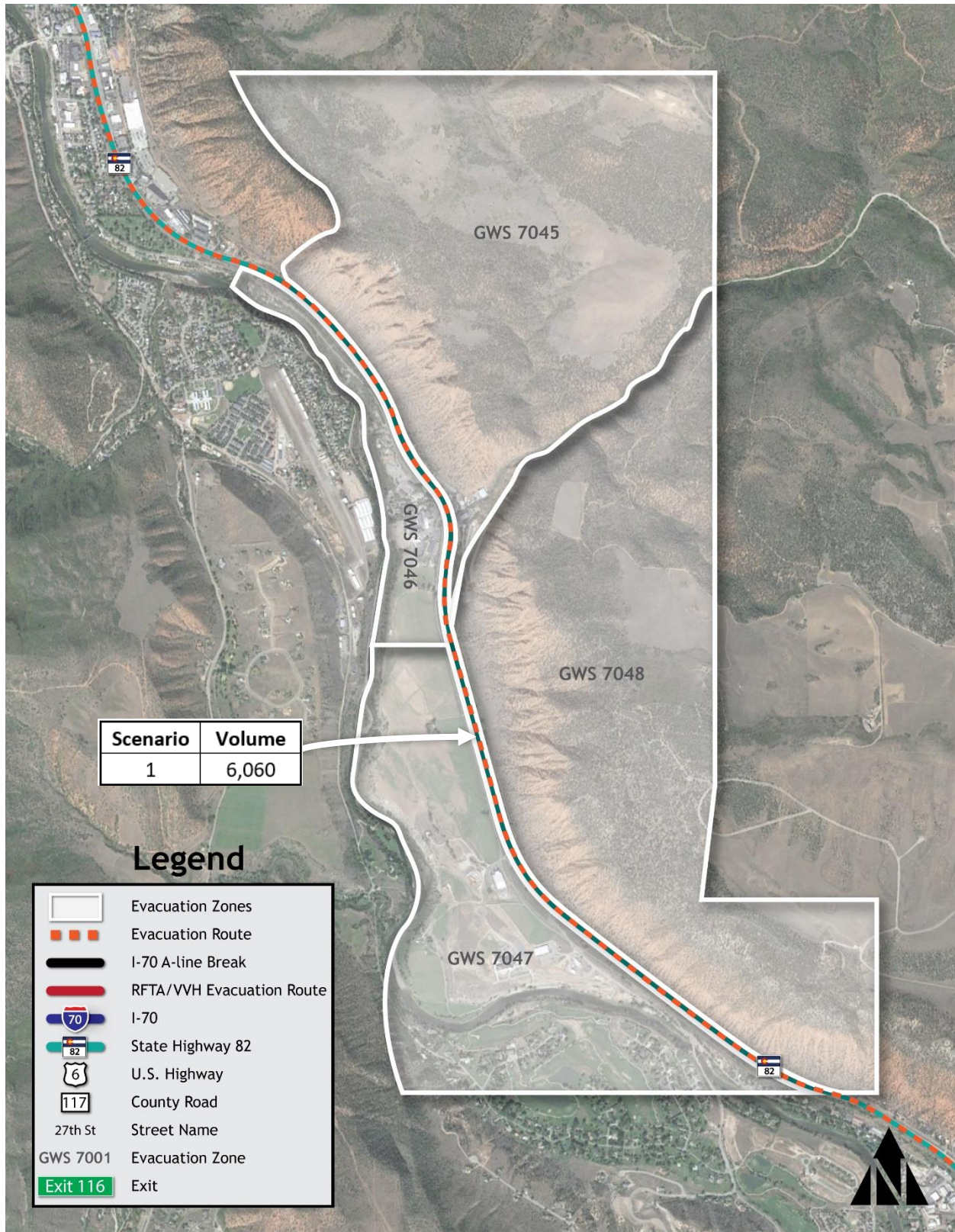
# GLENWOOD SPRINGS EVACUATION GUIDE



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|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------|
| Zone Name & Count                                           | South Grand Ave /GCR 154 Corridor<br>4 Zones                                                                                                                                     | Zones                      | Zones GWS 7045-7048 |
| City                                                        | Glenwood Springs                                                                                                                                                                 | County                     | Garfield            |
| Communities                                                 | -Garfield County<br>-South Glenwood Springs                                                                                                                                      | Areas of Refuge/Safe Zones |                     |
| Law Enforcement                                             | Garfield County SO                                                                                                                                                               | Fire Protection District   | Glenwood Springs FD |
| Evacuation Routes - other routes may be developed if needed | <b>Primary:</b><br>GCG 154 > SH 82                                                                                                                                               |                            |                     |
| Critical Facilities                                         | -Holy Cross Energy<br>-Riverview K8 School                                                                                                                                       |                            |                     |
| Critical Intersections to Control                           | -SH 82 MP 3 @ GCR 154<br>-SH 82 MP 5 @ GCR 154                                                                                                                                   |                            |                     |
| Special Considerations for this Zone                        | It may be necessary to close SH 82 at GCR 154 (MP 5) and SH 82 @ SH 133 (Carbondale). GCR 115 (Red Canyon Road) SB traffic will need to proceed to GCR 114 (Spring Valley Road). |                            |                     |
| Estimated Number of Vehicles to Evacuate (2030)             | 6,060                                                                                                                                                                            |                            |                     |
| Estimated Population (2030)                                 | Unknown                                                                                                                                                                          |                            |                     |
| Evacuation Scenarios                                        | Scenario 1 <ul style="list-style-type: none"> <li>100% of traffic is led SB on SH 82.</li> </ul>                                                                                 |                            |                     |



# GLENWOOD SPRINGS EVACUATION GUIDE



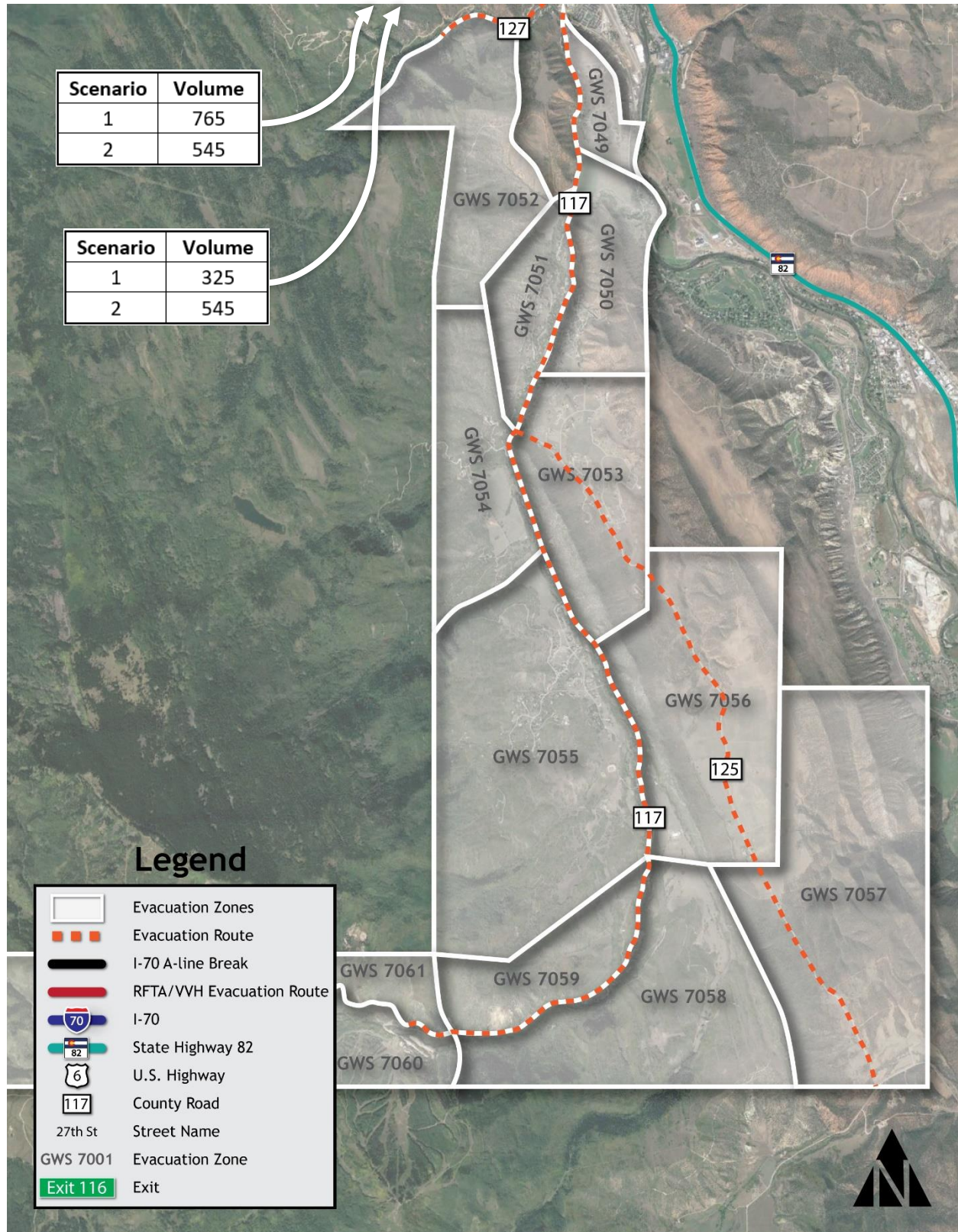
# GLENWOOD SPRINGS EVACUATION GUIDE



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|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zone Name & Count                                                    | 4-Mile Corridor<br>12 Zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Zones                            | Zones GWS 7049-7061                                                                                                                                                                                          |
| City                                                                 | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | County                           | Garfield                                                                                                                                                                                                     |
| Communities                                                          | -Oak Meadows<br>-Spring Ridge<br>-Ski Sunlight<br>-Black Diamond Mine<br>-Sunlight View<br>-4-Mile Ranch<br>-Cheylyn Acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Areas of<br>Refuge/Safe<br>Zones | -4-Mile Ranch<br>-Cheylyn Acres<br>-Black Diamond Mine<br>-Faranhyll Open Space<br>-Oak Meadows RV Storage Area<br>-Oak Meadows Park & Tennis Court<br>-Dry Park Rd<br>-Bersheni Ranch<br>-Sunlight Ski Area |
| Law Enforcement                                                      | Garfield County SO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Fire Protection<br>District      | Glenwood Springs FD                                                                                                                                                                                          |
| Evacuation Routes<br>- other routes may<br>be developed if<br>needed | <b>Primary:</b><br>GCR 117 (4-Mile Rd) > Midland Ave > 27 <sup>th</sup> St > South Glen Ave > I-70/SH 82 South/East<br><b>Alternate:</b><br>Midland Ave > 8 <sup>th</sup> St > Grand Ave > 6 <sup>th</sup> St > I-70 (Exit 116)<br><b>Alternate:</b><br>GCR 117 (4-Mile Road) to GCR 125 (Dry Park Road)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |                                                                                                                                                                                                              |
| Critical Facilities                                                  | -Glenwood Springs Fire Station #3<br>-Street/SWAT Facility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                  |                                                                                                                                                                                                              |
| Critical<br>Intersections to<br>Control                              | -Midland Ave @ 27 <sup>th</sup> St Roundabout      -8 <sup>th</sup> St @ Grand Ave<br>-27 <sup>th</sup> St @ South Grand Ave              -Grand Ave @ 6 <sup>th</sup> St Traffic Light<br>Roundabout                                      -6 <sup>th</sup> St @ I-70 Roundabout<br>-Midland Ave @ 8 <sup>th</sup> St                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |                                                                                                                                                                                                              |
| Special<br>Considerations for<br>this Zone                           | The 27 <sup>th</sup> Street roundabouts need to be monitored by traffic control personnel. GCR 125 (Dry Park Road) may be impassable dependent on road and weather conditions. Evacuation may require a split of egress traffic on both the primary and alternate evacuation routes to I-70, south on SH 82 towards Carbondale, and on GCR 125 towards Carbondale.                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |                                                                                                                                                                                                              |
| Estimated Number<br>of Vehicles to<br>Evacuate (2030)                | 1,090                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |                                                                                                                                                                                                              |
| Estimated<br>Population (2030)                                       | Unknown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                  |                                                                                                                                                                                                              |
| Evacuation<br>Scenarios                                              | Scenario 1 <ul style="list-style-type: none"> <li>70% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 27<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> </ul> Scenario 2 <ul style="list-style-type: none"> <li>70% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 27<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> <li>30% of traffic is led NB on GCR 117, NB on Midland Ave, EB on 8<sup>th</sup> St, and NB on SH 82 to I-70 On-Ramp at Exit 116.</li> </ul> *If traffic exceeds capacity on these roadways', vehicles can be sent on GCR 117 (4-Mile Road) to SB GCR 125 (Dry Park Road). |                                  |                                                                                                                                                                                                              |



# GLENWOOD SPRINGS EVACUATION GUIDE





# GLENWOOD SPRINGS EVACUATION GUIDE



## Assumptions for Evacuation Volumes

- Daily traffic volumes were received from the CDOT Statewide Model for 2015 and 2030.
- The average daily trips per household, as inferred from daily traffic volumes, was assumed to be 2 trips.
- For each group of zones, the largest 2030 one-way daily volume (BA\_DY\_FLOW) on the major road was documented; this volume was divided by the assumed average number of trips per vehicle per day (2 trips) to calculate the estimated number of vehicles that would be leaving these zones during an evacuation.
- All traffic within the evacuation zones will be completely redirected towards the designated evacuation routes.
- In the case of routes passing through both primary and secondary roads at a junction, the allocation of traffic will be determined based on engineering evaluations; most route volumes were split with primary routes accounting for 70% of the vehicles for scenario 1 and 50% of the vehicles for scenario 2.
- Evacuations of zone groups are assumed to be occurring without background traffic and not during other zone group evacuations.
- The evacuation duration was estimated based on the capacity of the major roadways in the zone groups (1,000 VPH for two-lane roads and 2,000 VPH for four-lane roads).

## Zone Group Scenarios, Routes, Volumes, and Evacuation Durations

Table 1: Zones 7001-7006 Evacuation Information

| Scenario   | Route                    | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|--------------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | WB US 6 to I-70 Exit 109 | 100%               | 420                       | 210                               | 105                               | 0.42                            | 1 hour              |

Table 2: Zones 7007-7012 Evacuation Information

| Scenario   | Route                                 | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|---------------------------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | To I-70                               | 100%               | 1450                      | 725                               | 363                               | 1.45                            | 1-2 hours           |
|            | To Storm King Rd Access Point to I-70 | 70%                | 1015                      | 508                               | 254                               | 1.02                            |                     |
|            | To Exit 114 by Mel Ray Rd             | 30%                | 435                       | 218                               | 109                               | 0.44                            |                     |
| Scenario 2 | To I-70                               | 100%               | 1450                      | 725                               | 363                               | 1.45                            | 1-2 hours           |
|            | To Storm King Rd Access Point to I-70 | 50%                | 725                       | 363                               | 181                               | 0.73                            |                     |
|            | To Exit 114 by Mel Ray Rd             | 50%                | 725                       | 363                               | 181                               | 0.73                            |                     |

Table 3: Zones 7013-7016 Evacuation Information

| Scenario   | Route                                 | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|---------------------------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | To I-70                               | 100%               | 2070                      | 1035                              | 518                               | 2.07                            | 2-3 hours           |
|            | US 6 to West 1st Access Point to I-70 | 70%                | 1450                      | 725                               | 363                               | 1.45                            |                     |
|            | US 6 to I-70 Exit 116                 | 30%                | 620                       | 310                               | 155                               | 0.62                            |                     |

# GLENWOOD SPRINGS EVACUATION GUIDE



|            |                                       |             |             |             |            |             |           |
|------------|---------------------------------------|-------------|-------------|-------------|------------|-------------|-----------|
| Scenario 2 | <b>To I-70</b>                        | <b>100%</b> | <b>2070</b> | <b>1035</b> | <b>518</b> | <b>2.07</b> | 2-3 hours |
|            | US 6 to West 1st Access Point to I-70 | 50%         | 1035        | 518         | 259        | 1.04        |           |
|            | US 6 to I-70 Exit 116                 | 50%         | 1035        | 518         | 259        | 1.04        |           |

Table 4: Zones 7017-7021 Evacuation Information

| Scenario   | Route          | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|----------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | NB to Exit 114 | 100%               | 1210                      | 605                               | 303                               | 1.21                            | 1-2 hours           |

Table 5: Zones 7022-7029 Evacuation Information

| Scenario   | Route                 | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|-----------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | <b>NB Midland Ave</b> | <b>100%</b>        | <b>2480</b>               | <b>1240</b>                       | <b>620</b>                        | <b>2.48</b>                     | 2-3 hours           |
|            | WB to Exit 116        | 70%                | 1735                      | 868                               | 434                               | 1.74                            |                     |
|            | NB to Exit 114        | 30%                | 745                       | 373                               | 186                               | 0.75                            |                     |
| Scenario 2 | <b>NB Midland Ave</b> | <b>100%</b>        | <b>2480</b>               | <b>1240</b>                       | <b>620</b>                        | <b>2.48</b>                     | 2-3 hours           |
|            | WB to Exit 116        | 50%                | 1240                      | 620                               | 310                               | 1.24                            |                     |
|            | NB to Exit 114        | 50%                | 1240                      | 620                               | 310                               | 1.24                            |                     |

Table 6: Zones 7030-7044 Evacuation Information

| Scenario   | Route                | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|----------------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | <b>WB SH 82</b>      | <b>100%</b>        | <b>7760</b>               | <b>3880</b>                       | <b>1940</b>                       | <b>3.88</b>                     | 3-4 hours           |
|            | WB SH 82 to Exit 116 | 70%                | 5430                      | 2715                              | 1358                              | 2.72                            |                     |
|            | WB SH 82 to Exit 114 | 30%                | 2330                      | 1165                              | 583                               | 2.33                            |                     |
| Scenario 2 | <b>WB SH 82</b>      | <b>100%</b>        | <b>7760</b>               | <b>3880</b>                       | <b>1940</b>                       | <b>3.88</b>                     | 3-4 hours           |
|            | WB SH 82 to Exit 116 | 50%                | 3880                      | 1940                              | 970                               | 1.94                            |                     |
|            | WB SH 82 to Exit 114 | 50%                | 3880                      | 1940                              | 970                               | 3.88                            |                     |

Table 7: Zones 7045-7048 Evacuation Information

| Scenario   | Route          | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|----------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | SB to SE SH 82 | 100%               | 6060                      | 3030                              | 1515                              | 3.03                            | 3 hours             |

Table 8: Zones 7049-7061 Evacuation Information

| Scenario   | Route          | % of Total Traffic | # of Vehicles to Evacuate | 2-Hour Evacuation (hourly volume) | 4-Hour Evacuation (hourly volume) | Shortest Time to Evacuate (hrs) | Evacuation Duration |
|------------|----------------|--------------------|---------------------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------|
| Scenario 1 | <b>To I-70</b> | <b>100%</b>        | <b>1090</b>               | <b>545</b>                        | <b>273</b>                        | <b>1.09</b>                     | 1-2 hours           |

# GLENWOOD SPRINGS EVACUATION GUIDE



|            |                                     |             |             |            |            |             |           |
|------------|-------------------------------------|-------------|-------------|------------|------------|-------------|-----------|
|            | To I-70 using Midland Ave > 27th St | 70%         | 765         | 383        | 191        | 0.77        |           |
|            | To I-70 using Midland Ave > 8th St  | 30%         | 325         | 163        | 81         | 0.33        |           |
| Scenario 2 | <b>To I-70</b>                      | <b>100%</b> | <b>1090</b> | <b>545</b> | <b>273</b> | <b>1.09</b> | 1-2 hours |
|            | To I-70 using Midland Ave > 27th St | 50%         | 545         | 273        | 136        | 0.55        |           |
|            | To I-70 using Midland Ave > 8th St  | 50%         | 545         | 273        | 136        | 0.55        |           |



# Glenwood Springs

## Emergency Operations / Traffic Emergency Management Plan



Prepared for:

City of Glenwood Springs

Prepared by:



# Outreach

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- In 2023 City commissioned an evacuation plan through outside contractor
- May 2024 plan was presented to the Council
- The evacuation plan was made available at the FD open house – Spring 2024
- A community meeting was offered/held at the Recreation Center – Sept. 2024
- Materials available on the FD web site
- May look for another opportunity for community meeting

# Public Expectations

- There is no water system in the U.S. that could've effectively handled the L.A. fires
- In a conflagration and very high wind driven event it is difficult to keep up (i.e. Louisville, CO Fires)
- As you continue to open hydrants that affects other hydrants, pressures etc.
- Large diameter pipes required in order to sufficiently provide resources to fight the fire
- In turn that compromises the pressures needed to effectively address fires – may have to shut off water to other neighborhoods





# Public safety training/Preparedness

- This last Tues. Pub. Safety Chief and Dep. Chief attended training with Federal, state, Garfield, Larimer, and Mesa county fire authorities
- Understanding of each FD and agency responsibilities/costs
- Included County emergency managers, Communications personnel and stakeholders
- This occurs annually in preparation of fire season/wildland fires
- Ensures mutual aid and other agreements are current



# Water access



Widely reported LA fire crews challenged with limited water sources:



GWS hosts several water tanks/sources



Many of these exceed 1 million gallons of water and others north of 500,000 gallons of water

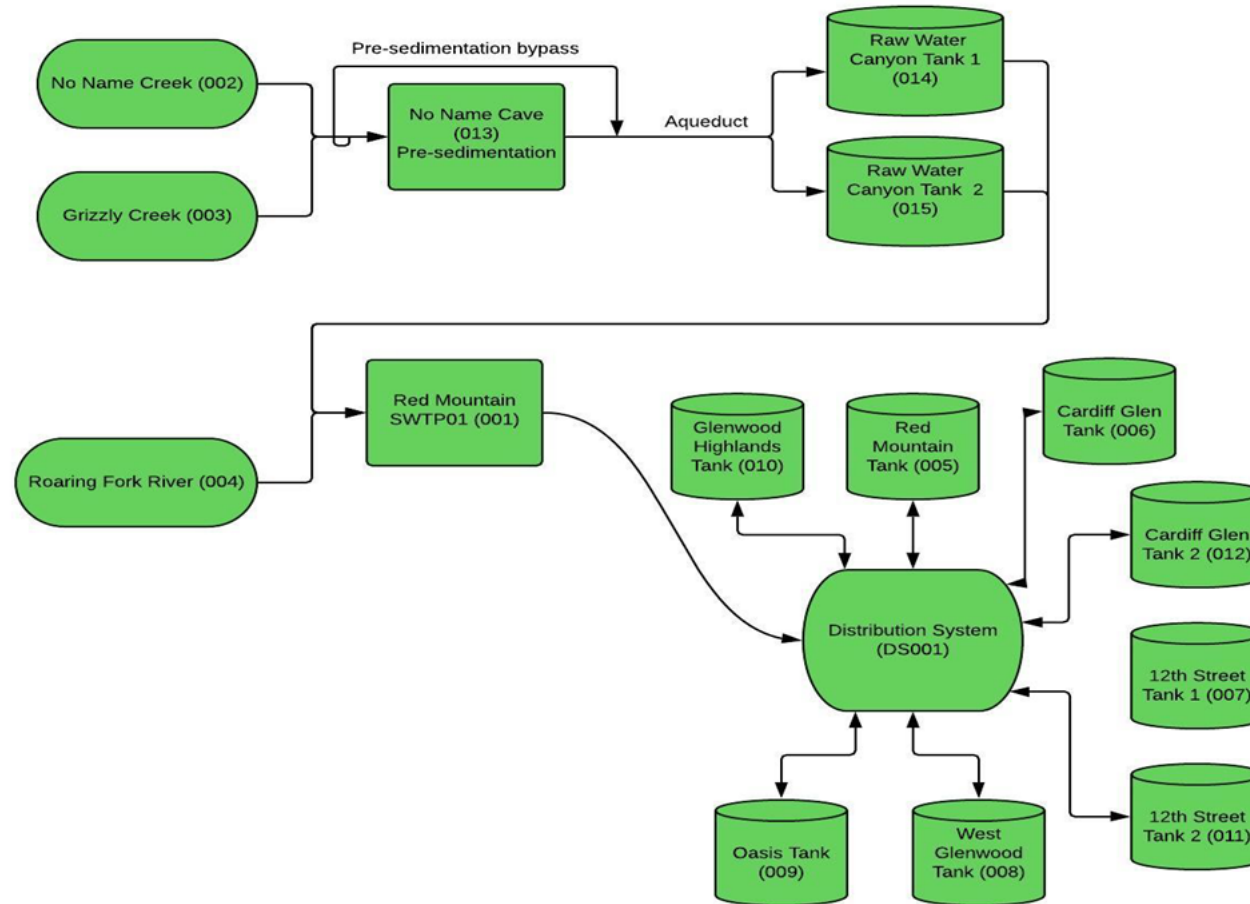


Water Dept. has ability to re direct, shut off zones to allow for more directed water and pressure to a fire scene



City has more than 700 hydrants and large capacity tanks supported by water plant and equipment (tenders etc)

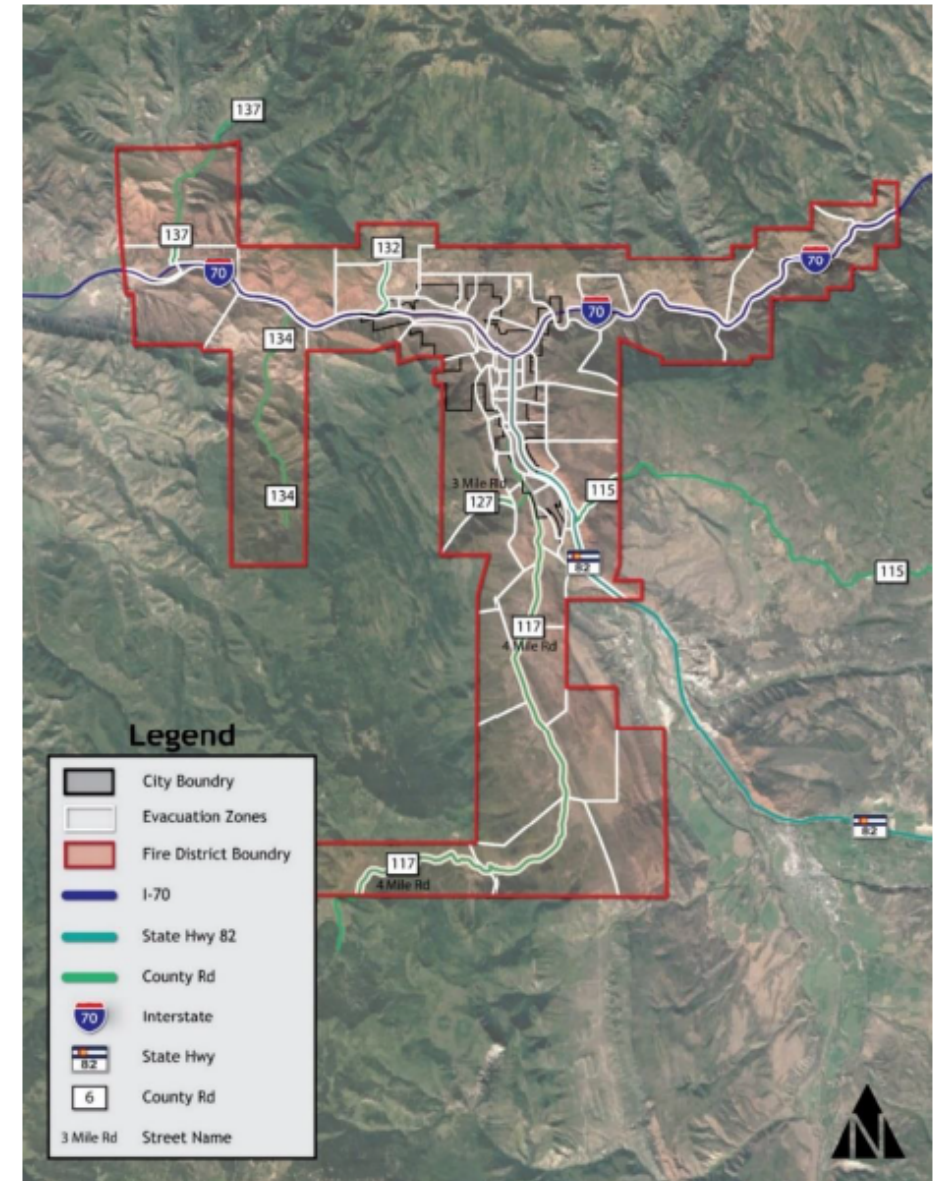
## City of Glenwood Springs Facility Flows



# Coverage area

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- GSFD covers 72 square miles
  - Typical staffing is:
  - 8 Firefighters and 1 Battalion Chief
  - That includes Paramedics/EMT's
- 

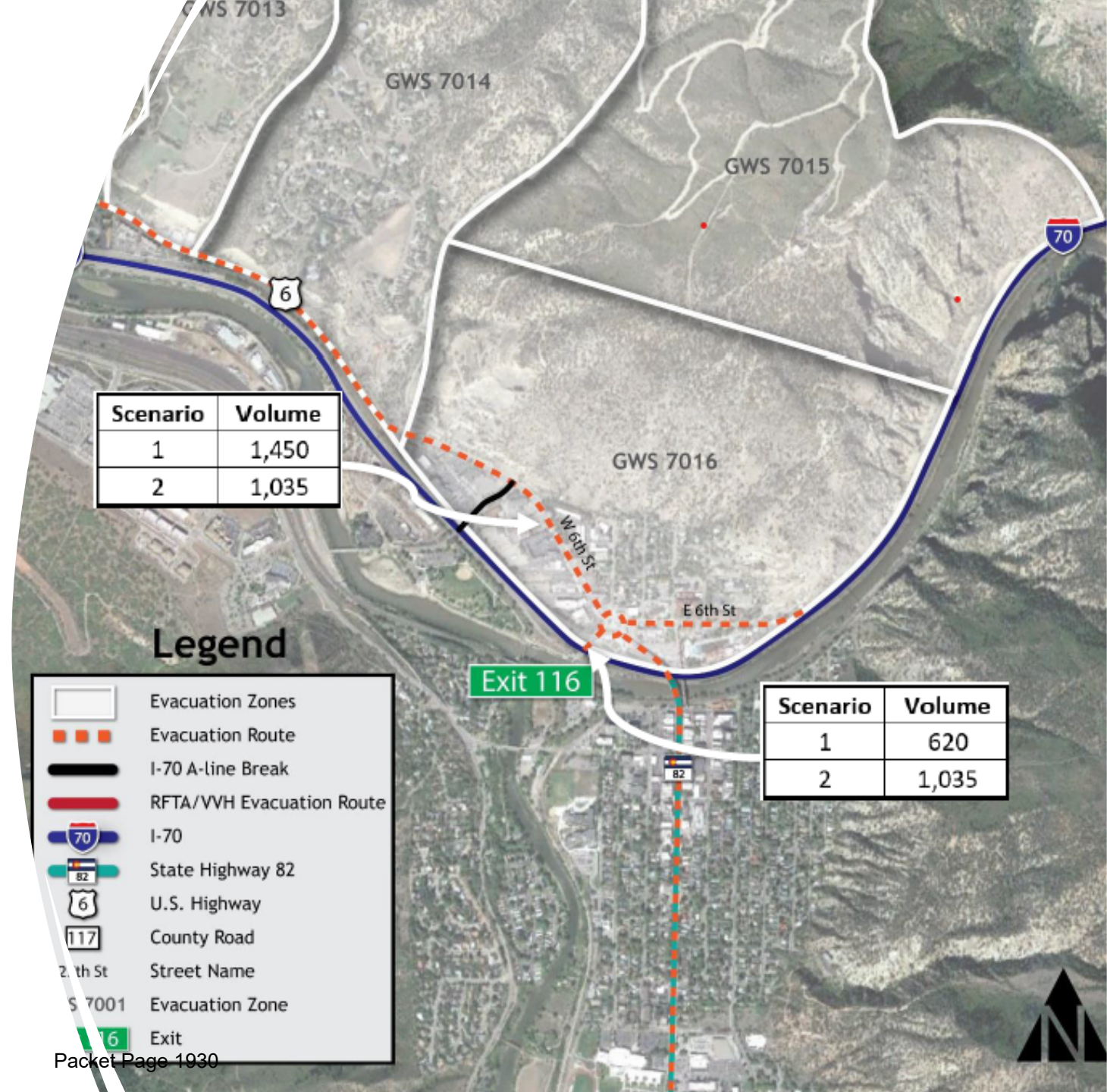


**Figure 7. Evacuation Zones**  
[Glenwood Springs Evacuation Zones](#)



# Polygons

- Incident commander determines evac zones by polygons
- Communications staff messages this to affected neighborhoods
- Law Enforcement/Public works initiates evac and traffic egress



# Next steps



PUBLIC SAFETY PERSONNEL AND  
PUBLIC WORKS STAFF TO WORK  
THROUGH TABLETOP EXERCISES IN  
PREPARATION



A- LINE BREAKS ARE IN PLACE

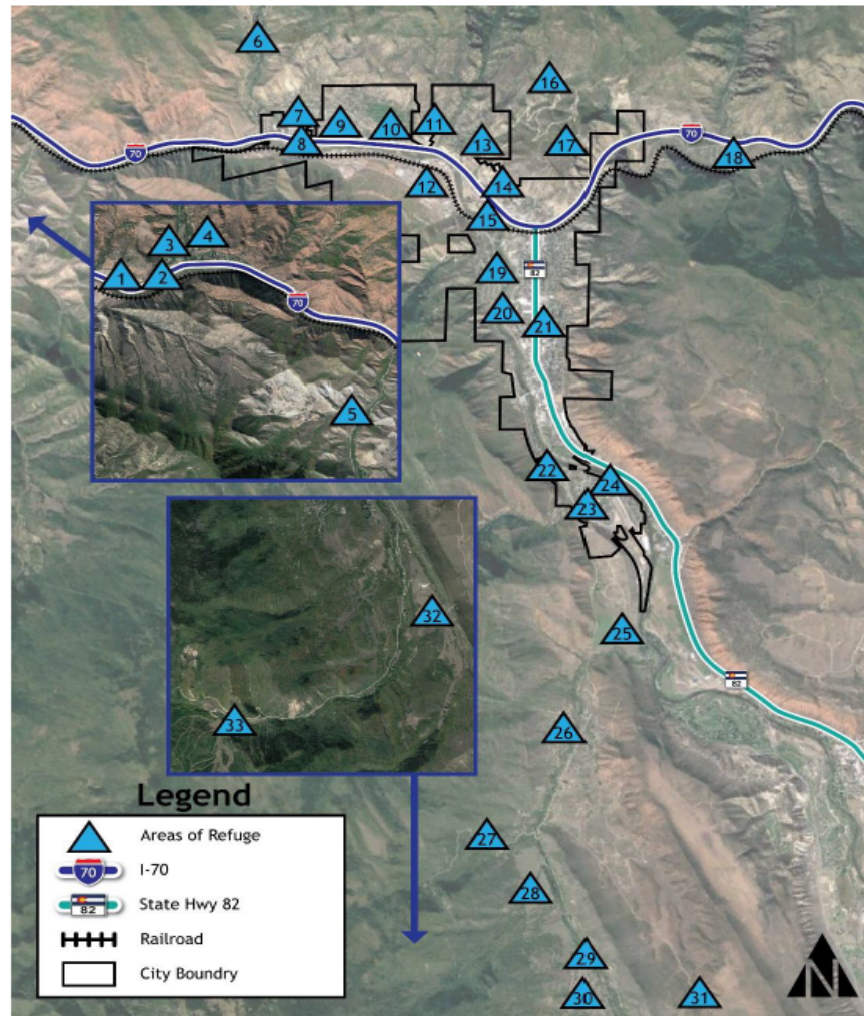


PUBLIC WORKS STAFF TO PROCURE  
DEDICATED MATERIALS FOR EVACS IN  
STORAGE AT THE M.O.C.



## APPENDIX E: AREAS OF REFUGE / SAFE ZONES

| #  | Areas of Refuge                      |
|----|--------------------------------------|
| 1  | New Creation Church                  |
| 2  | CPW Office                           |
| 3  | Orchard Creek Ranch                  |
| 4  | Canyon Creek Estates                 |
| 5  | South Canyon Landfill                |
| 6  | Upper Mitchell Creek Open Ranch Land |
| 7  | Diemoz Pasture                       |
| 8  | Glenwood Springs Mall                |
| 9  | GSMS Ball Fields                     |
| 10 | Glenwood Springs Golf Club           |
| 11 | Highlands Ranchland                  |
| 12 | Meadows Mall                         |
| 13 | Oasis Creek Park                     |
| 14 | Transfer Trail Parking               |
| 15 | Two Rivers Park                      |
| 16 | RMR Quarry                           |
| 17 | Glenwood Caverns Adventure Park      |
| 18 | No Name Rest Area                    |
| 19 | Veltus Park                          |
| 20 | Paraglider Landing Zone              |
| 21 | Sayre Park                           |
| 22 | Old Cardiff Bridge Rd                |
| 23 | Sopris Elementary School             |
| 24 | Sullivan Park                        |
| 25 | 4 Mile Ranch                         |
| 26 | Cheylyn Acres                        |
| 27 | Black Diamond Mine                   |
| 28 | Faranhyll Open Space                 |
| 29 | Oak Meadows RV Storage Area          |
| 30 | Oak Meadows Park & Tennis Court      |
| 31 | Dry Park Road                        |
| 32 | Bersheni Ranch                       |
| 33 | Sunlight Ski Area                    |





**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Ordinance 2025-04; Model Traffic Code Cell Phones

**Action Requested:** Adopt on First Reading

**Department:** Police Department

**Presented By:** Karl Hanlon

**Strategic Goals:** Ensure Public Safety

**Background Info:** Last year the General Assembly enacted SB24-065 which prohibits the use of a mobile device such as a cell phone while operating a motor vehicle. The City has duly adopted the 2020 version of the Model Traffic Code which gives the City the authority to enforce state rules of the road. With the addition of this provision to the City's version of the Model Traffic Code, it can now enforce the prohibition of mobile device use while operating a motor vehicle.

**Issues:** Public Safety and Conforming with State Law

**Fiscal Impact:** N/A

**Legal Review:** Drafted by City Attorney

**Staff Recommendation:** Approve on First Reading

## ORDINANCE NO. 4

Series of 2025

### **AN ORDINANCE OF THE CITY OF GLENWOOD SPRINGS, COLORADO, AMENDING SECTION 120.040.020 OF THE GLENWOOD SPRINGS MUNICIPAL CODE TO PROHIBIT USE OF A MOBILE DEVICE WHILE DRIVING.**

**WHEREAS**, the City of Glenwood Springs (“Glenwood Springs” or the “City”) is a home-rule municipality organized under Article XX of the Colorado Constitution and with the authority of the Glenwood Springs Home Rule Charter (the “Charter”); and

**WHEREAS**, Section 120.040.020 of the Glenwood Springs Municipal Code (the “Code”) sets forth local additions, deletions, or modifications to the Model Traffic Code; and

**WHEREAS**, the State passed a law, Section 42-4-239, C.R.S., effective January 1, 2025, that regulates the use of a mobile electronic device while operating a motor vehicle; and

**WHEREAS**, City Staff has recommended adopting this new law and adding it to the local additions, deletions, or modifications to the Model Traffic Code under Section 120.040.020 of the Code; and

**WHEREAS**, the City Council finds and declares that the Code amendments as set forth in **Exhibit A** attached hereto and incorporated by this reference are necessary to protect the health, safety, and welfare of the citizens of the City.

### **NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF GLENWOOD SPRINGS, COLORADO, ORDAINS:**

**Section 1.**     **Recitals.** The foregoing recitals are incorporated herein as if set forth in full.

**Section 2.**     **Amendments.** The Code is hereby amended as set forth in the attached **Exhibit A**.

INTRODUCED, READ ON FIRST READING, PASSED AND ORDERED PUBLISHED BY  
TITLE ONLY THIS \_\_\_\_ DAY OF \_\_\_\_\_ 2025.

CITY OF GLENWOOD SPRINGS, COLORADO

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Ingrid Wussow, Mayor

ATTEST:

---

Ryan Muse, City Clerk

INTRODUCED, READ ON SECOND READING, AND ORDERED PUBLISHED BY  
TITLE ONLY TO BE EFFECTIVE TEN DAYS FOLLOWING THE DATE OF SECOND  
PUBLICATION THIS \_\_\_\_ DAY OF \_\_\_\_\_ 2025.

CITY OF GLENWOOD SPRINGS, COLORADO

---

Ingrid Wussow, Mayor

ATTEST:

---

Ryan Muse, City Clerk

## EXHIBIT A

The following sections of the Municipal Code are amended as follows with double underlined text added and ~~strike through text~~ deleted.

### TITLE 120 – CRIMINAL PROVISIONS

#### ARTICLE 120.010 – TRAFFIC REGULATIONS

#### ARTICLE 120.040 – Additions, deletions, or modifications to the Model Traffic Code.

\* \* \* \*

- (2) Part ~~62~~, Subsection 225(3) of the Model Traffic Code is hereby amended as follows:

"(3) Any person who violates subsection (1) of this section commits a class B traffic infraction. Any person who violates subsection (1.5) of this section shall, upon conviction, be punished by a fine of five hundred dollars (\$500.00)."

- (2.5) Part 2, Section 239 of the Model Traffic Code is hereby replaced by the text of Section 42-4-239 C.R.S. effective January 1, 2025, as follows:

Section 239. Use of a mobile electronic device - definitions - penalty.

- (1) As used in this section, unless the context otherwise requires:

(a) "Emergency" means a circumstance in which an individual:

- (I) Has reason to fear for the individual's life or safety or believes that a criminal act may be perpetrated against the individual or another individual, requiring the use of a mobile electronic device when the individual is driving a motor vehicle; or
- (II) Reports a fire, a traffic accident in which one or more injuries are apparent, a serious road hazard, a medical or hazardous materials emergency, or an individual who is driving in a reckless, careless, or unsafe manner.

(b) "First responder" means:

- (I) A peace officer, as described in section 16-2.5-101;
- (II) A firefighter, as defined in section 29-5-203 (10);
- (III) A volunteer firefighter, as defined in section 31-30-1102 (9)(a);
- (IV) An emergency medical service provider, as defined in section 25-3.5-103 (8); or
- (V) Any other individual who responds in a professional capacity to a public safety emergency.

(c) "Hands-free accessory" means an accessory with a feature or function that enables an individual to use a mobile electronic device without using either hand, except to activate, deactivate, or initiate the feature or function with a single touch or single swipe.

(d) (I) "Mobile electronic device" means a handheld or portable electronic device capable of providing voice communication between two or more persons, amusement, or the wireless transfer of data.

(II) "Mobile electronic device" does not include:

(A) A radio, citizens band radio, or citizens band radio hybrid;

(B) A commercial two-way radio communication device or its functional equivalent;

(C) A subscription-based emergency communication device;

(D) A prescribed medical device;

(E) An amateur or ham radio device; or

(F) Systems that are designed for and installed within the vehicle's electronics, such as an in-vehicle security, navigation, communications, or remote diagnostics system.

(e) "Operating a motor vehicle" means driving a motor vehicle on a public highway. "Operating a motor vehicle" does not include maintaining the instruments of control of a motor vehicle while the motor vehicle is at rest in a shoulder lane or lawfully parked.

(f) "Use" or "using" means:

(I) Physically holding a mobile electronic device in the driver's hand or pinning a mobile electronic device to a driver's ear to conduct voice-based communication; except that an individual may use a speaker or other listening device that is built into protective headgear or a device or portion of a device that only covers all or a portion of one ear and that is connected to a wireless, handheld telephone as provided in section 42-4-1411;

(II) Watching a video or movie on a mobile electronic device, other than watching data related to the navigation of the motor vehicle; or

(III) Writing, sending, or reading text-based communication, including a text message, instant message, e-mail, or internet data, on a mobile electronic device; except that text-based communication does not include:

(A) A voice-based communication that is automatically converted by the mobile electronic device to be sent as a message in written form; or

(B) Communication concerning the navigation of a motor vehicle.

(2) Except as specified in subsection (3) of this section, an individual shall not use a mobile electronic device while operating a motor vehicle.

(3) It is not a violation of subsection (2) of this section to use a mobile electronic device:

(a) To contact a public safety entity;

(b) During an emergency;

(c) When an employee or contractor of a utility is acting within the scope of the employee's or contractor's duties when responding to a utility emergency;

(d) When an employee or contractor of a city or county is acting within the scope of the employee's or contractor's duties as a code enforcement officer or animal protection officer; or

(e) During the performance of a first responder's official duties.



- (4) (a) Except as provided in subsection (4)(b) of this section, an individual who violates this section commits a class A traffic infraction, and the court shall assess a penalty as follows:
- (I) A fine of seventy-five dollars and a surcharge of ten dollars for the first offense within the immediately preceding twenty-four months;
  - (II) A fine of one hundred fifty dollars and a surcharge of ten dollars for the second offense within the immediately preceding twenty-four months; or
  - (III) A fine of two hundred fifty dollars and a surcharge of ten dollars for the third or subsequent offense within the immediately preceding twenty-four months.
- (b) (I) An individual charged with violating subsection (2) of this section shall not be convicted if the individual:
- (A) Produces a hands-free accessory or proof of purchase of a hands-free accessory; and
  - (B) Affirms under penalty of perjury that the individual has not previously had a charge dismissed under this subsection (4)(b).
- (II) The court clerk may dismiss the charge if the clerk verifies that the individual has complied with both subsections (4)(b)(I)(A) and (4)(b)(I)(B) of this section.
- (c) If the individual's actions are the proximate cause of bodily injury to another, the individual commits a class 1 misdemeanor traffic offense and shall be punished as provided in section 42-4-1701 (3)(a)(II).
- (d) If the individual's actions are the proximate cause of death to another, the individual commits a class 1 misdemeanor traffic offense and shall be punished as provided in section 42-4-1701 (3)(a)(II).
- (5) This section does not apply to an individual with a commercial driver's license who is operating a commercial vehicle.
- (6) An individual operating a motor vehicle shall not be cited for a violation of subsection (2) of this section unless a law enforcement officer saw the individual use a mobile electronic device in a manner that caused the individual to drive in a careless and imprudent manner, without due regard for the width, grade, curves, corners, traffic, and use of the streets and highways and all other attendant circumstances, as prohibited by section 42-4-1402.
- (7) This section does not authorize the seizure and forfeiture of a mobile electronic device, unless otherwise provided by law.

\* \* \* \*



**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** Financial Advisory Board (FAB) Grant Direction

**Action Requested:** Expecting more requests than money, FAB has asked for Council direction on funding preferences.,

**Department:** City Administration

**Presented By:** Steve Boyd

**Strategic Goals:** Protect and Preserve our Quality of Life

**Background Info:** Anything Council wants is on the table, a couple of specific questions:  
1. Does Council want to award money for Summer of Music and/or Strawberry Days off the top?  
2. Would you like to have a time limit? For example we don't fund more than three years so that no one other than the two above starts to count on this as part of their operating budget.  
3. Are there causes you would like FAB to not fund or limit funding for this year?

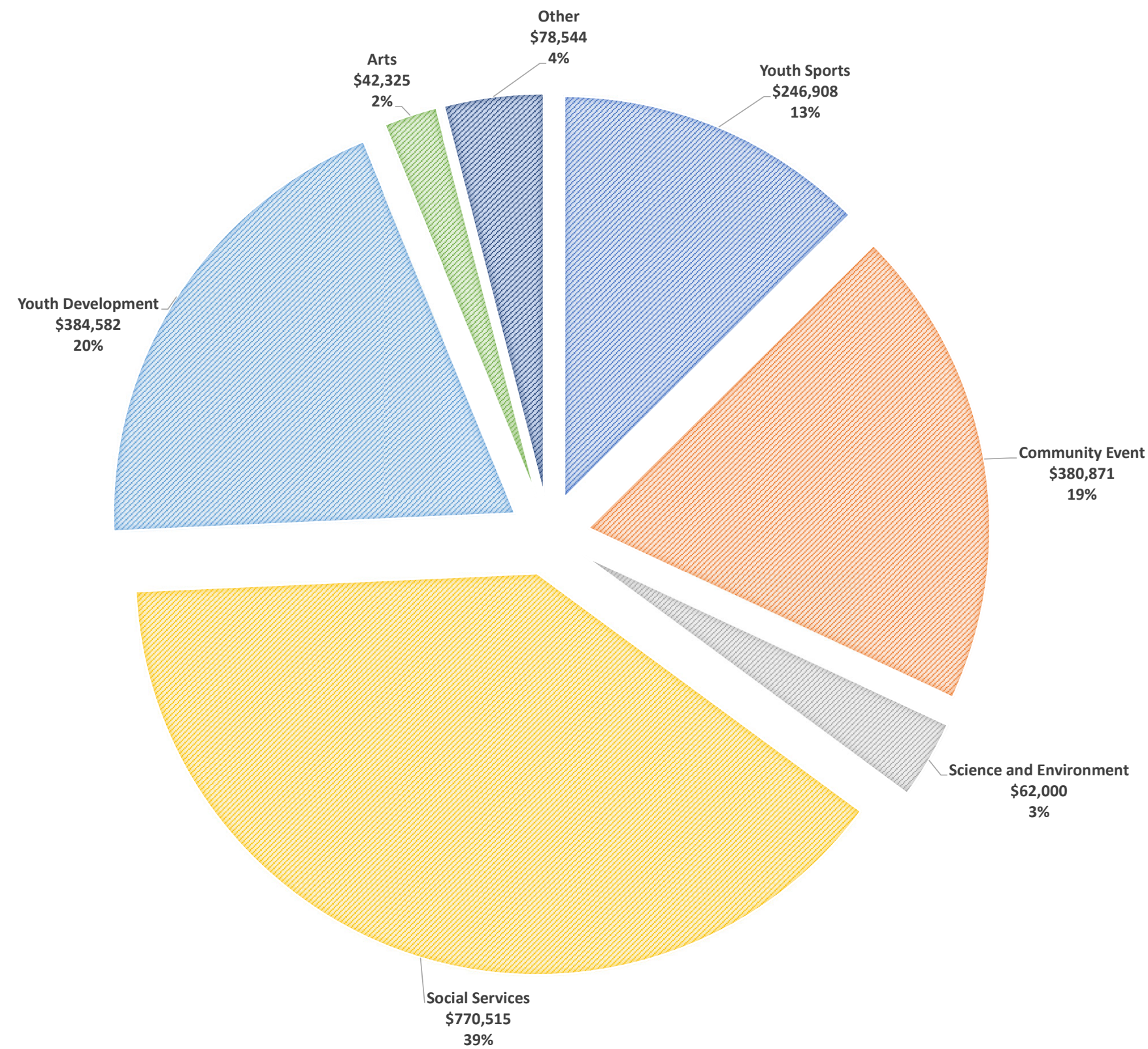
**Issues:** NA

**Fiscal Impact:** Roughly \$201,000 is available in the A&I Fund and \$81,250 in Tourism.

**Legal Review:** NA

**Staff Recommendation:** NA

FINANCIAL ADVISORY BOARD (FAB) GRANTS 2015-2024





**City Council**  
**STAFF REPORT**  
**City of Glenwood Springs**  
**February 6, 2025**

**Agenda Item:** City Council Social Event Location

**Action Requested:** City Council will announce where they will meet after the meeting for a social event.

**Department:** City Clerk

**Presented By:**

**Strategic Goals:**

**Background Info:**

**Issues:**

**Fiscal Impact:**

**Legal Review:**

**Staff Recommendation:**